

Crosley Leads Manufacturers in Number Of Publications Used in 1936

(Concluded from Page 1, Column 4)
& Mfg. Co., which spent \$357,545, of which \$226,375 went for refrigerators alone, \$7,390 for water coolers, and \$123,780 for electric kitchen equipment.

Servel, Inc., was third with an expenditure of \$356,698, the company spending \$72,378 on its kerosene unit and \$284,320 on the gas-operated Electrolux.

Next was General Electric Co., of whose \$346,062 total \$326,562 went for household refrigeration, and \$19,500 on the refrigerator, range, and dishwasher combination.

Frigidaire division of General Motors Corp. was fifth with an expenditure of \$252,556 in 10 magazines. Household refrigerators accounted for \$220,390 of the total, with \$24,920 being spent for water coolers and \$7,246 for commercial refrigeration space.

Norge division of Borg-Warner Corp. spent \$206,550 in four periodicals, \$88,050 of that amount being on the refrigerator alone, and an additional \$118,500 on the full Norge electric kitchen equipment line.

Crosley Radio Corp. spent \$120,328 in refrigerator advertising during the year, \$118,301 being on the household electric line and \$2,027 on the Icyball refrigerator, for use in rural areas. As usual, Crosley led the field in the number of publications used, total for last year being an even 30.

Leonard Refrigerator Co. spent \$96,600 in magazine advertising last year, all of it in Saturday Evening Post.

Crosley

Crosley Radio Corp.

(Crosley electric refrigerator).....	\$118,301
Saturday Evening Post	16,500
Liberty	14,052
McCall's	12,839
Good Housekeeping	12,591
Time	10,437
Collier's	4,436
Woman's Home Companion	4,343
Ladies' Home Journal	4,275
True Story	3,835
American Magazine	3,696
Hearst's Cosmopolitan	3,612
Pictorial Review	3,250
Better Homes & Gardens	3,192
Household	2,931
Delineator	2,888
National Geographic	2,584
Literary Digest	2,196
Woman's World	2,016
The New Yorker	1,872
Redbook	1,680
The American Home	1,501
The Parents' Magazine	1,290
Popular Mechanics	900

House & Garden	600
Fortune	552
Harper's Bazaar	223
Vogue	210

Fairbanks-Morse

Home Appliance Division,
Fairbanks, Morse & Co.

(Fairbanks-Morse electric refrigerator)	\$ 40,250
Saturday Evening Post	20,000
Good Housekeeping	12,000
Collier's	8,250

Frigidaire

Frigidaire Division, General Motors Corp.

(Frigidaire electric refrigerator).....	\$220,390
Saturday Evening Post	77,900
Ladies' Home Journal	45,450
Good Housekeeping	33,000
Collier's	29,600
Liberty	18,140
Literary Digest	16,300
(Frigidaire water cooler).....	\$ 24,920
Nation's Business	7,700
Time	7,430
Business Week	5,590
Literary Digest	3,100
Fortune	1,100
(Frigidaire commercial refrigeration)	\$ 7,246
Saturday Evening Post	2,360
Collier's	1,734
Nation's Business	1,300
Time	980
Literary Digest	872

General Electric

General Electric Co.

(General Electric refrigerator).....	\$326,562
Saturday Evening Post	142,500
Ladies' Home Journal	45,000
Collier's	39,500
Good Housekeeping	30,000
American Magazine	27,500
Better Homes & Gardens	20,050
The American Home	16,162
House & Garden	5,850
(Hotpoint electric refrigerator)	\$ 24,000
Saturday Evening Post	24,000

Kelvinator

Kelvinator Corp.

(Kelvinator electric refrigerator).....	\$432,824
Saturday Evening Post	178,200
Collier's	95,020
Woman's Home Companion	36,052
McCall's	31,766
American Magazine	23,100
Good Housekeeping	19,800
Time	13,033
Esquire	12,943
Fortune	7,590
The New Yorker	6,600
House & Garden	4,400

Leonard

Leonard Refrigerator Co.

(Leonard electric refrigerator).....	\$ 96,600
Saturday Evening Post	96,600

Norge

Norge Corp.

(Norge electric refrigerator)	\$ 88,050
Saturday Evening Post	28,500
Good Housekeeping	21,000
Ladies' Home Journal	19,800
Collier's	18,750

Westinghouse

Westinghouse Electric & Mfg. Co.

(Westinghouse electric refrigerator)	\$226,375
Saturday Evening Post	120,175
Collier's	50,300
Good Housekeeping	27,900
American Magazine	14,000
Hearst's-Cosmopolitan	14,000
(Westinghouse water cooler).....	\$ 7,390
Time	7,390

Coolerator

Coolerator Co.

(Coolerator ice refrigerator)	\$ 59,000
Saturday Evening Post	50,500
Collier's	8,500

Crosley

Crosley Radio Corp.

(Crosley icycall refrigerator)	\$ 2,027
Country Home	784
Successful Farming	672
Capper's Farmer	571

Perfection

Perfection Stove Co.

(Superflex oil burning refrigerator)	\$ 30,439
Capper's Farmer	9,050
Successful Farming	7,895
Country Gentleman	5,900
Household	3,750
Farmer's Wife	2,300
Ladies' Home Journal	1,069
Better Homes & Gardens	675

Servel

Servel, Inc.

(Electrolux kerosene refrigerator).....	\$ 72,378
Country Gentleman	32,625
Farmer's Wife	13,593
Successful Farming	10,260
Capper's Farmer	9,600
Country Home	6,300
(Electrolux gas refrigerator).....	\$284,320
Saturday Evening Post	87,400
Collier's	41,100
Good Housekeeping	39,000
McCall's	30,640
Liberty	20,180
American Magazine	18,000
Hearst's-Cosmopolitan	16,800
Better Homes & Gardens	16,200
Time	15,000

MISCELLANEOUS

General Electric

General Electric Co.

(Dishwasher, range, and refrigerator)	\$ 19,500
Saturday Evening Post	11,500
Collier's	8,000

Norge

Norge Corp.

(Norge electric kitchen equipment)	\$118,500
Saturday Evening Post	60,200
Good Housekeeping	26,000
Ladies' Home Journal	19,800
Collier's	12,500

Westinghouse

Westinghouse Electric & Mfg. Co.

(Westinghouse electrical kitchen equipment)	\$123,780
Ladies' Home Journal	33,750
Woman's Home Companion	21,850
Good Housekeeping	19,800
Better Homes & Gardens	14,080
Saturday Evening Post	13,225
The American Home	10,950
McCall's	10,125

Fans & Unit Heaters Show Sales Increase

(Concluded from Page 1, Column 5)
year. Industrial systems totaled \$145,633, against \$114,570 during March, 1936.

Orders for refrigerating or cooling systems sold to contractors for separate installation totaled \$378,684 during the month, compared with a total of \$136,297 in March of last year.

Air-washer orders rose during the month to \$146,046 compared with \$74,352 in the same period last year, but filter orders totaled \$34,542 compared with \$48,551 in March, 1936. Humidifier orders were up to \$170,449, as against a March figure of \$47,618 last year.

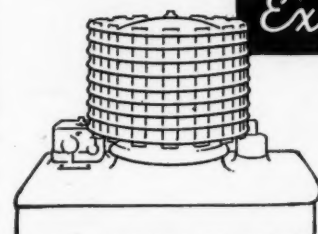
In the fan group, orders totaled \$1,840,449 during the month, compared with \$1,075,733 in March last year, and unit heater group orders were \$1,046,558, against \$562,401 in the same month of 1936.

March Air-Conditioning Orders Booked More Than Double Last Year

Item	Value of Orders Booked		
	March 1937	March 1936	Total, 3 Mos. Jan.-March 1937
Total	\$8,702,324	\$3,570,701	\$12,409,392
Air-Conditioning Group—Total	\$5,815,317	\$1,932,567	\$11,209,435
Unit Systems			
Self-contained (shipped substantially complete).....	1,154,521	135,362	1,805,277
Not self-contained (shipped in sections), including refrigerating or cooling medium.....	1,399,247	639,665	2,877,334
Central-station Systems, excluding installation if installed—			
Human comfort (including refrigerating or cooling medium sold separately or otherwise for air conditioning)*	2,385,955	736,152	4,411,943
Industrial (including refrigerating or cooling medium sold separately or otherwise for air conditioning)*	145,633	114,570	248,753
Refrigerating or cooling medium sold to contractors or other distributing outlets (not manufacturing air-conditioning equipment) for air-conditioning systems, when such knowledge as to the application is available	378,684	136,297	1,037,625
Air washers, including pumps and motors and control where furnished	146,046	74,352	268,991
Air filters (not including sales of filters used with machinery other than fans)	34,542	48,551	72,531
Humidifiers	170,689	47,618	496,981
Fan Group—Total	\$1,840,449	\$1,075,733	\$ 4,566,144
Fans, including bearings, pulleys or couplings (if furnished)—			
For public and semi-public buildings.....	199,413	179,441	464,821
For general industrial uses	691,028	355,975	1,594,816
For mechanical draft	304,796	156,132	810,985
For jobber stocks and unknown uses	121,747	57,096	311,357
Small housed and propeller fans—			
Direct connected small housed blowers with motors and control (merchandise motors).....	143,084	77,815	424,596
Propeller fans, direct connected and belted (for ventilation only)	236,949	169,410	667,542
Driving mechanism for general fan use (not reported above)—			
Electric motors and controllers (manufactured or jobbed)	90,046	69,849	223,462
Steam engines (manufactured or jobbed).....	53,386	10,315	68,535
Steam turbines (manufactured or jobbed).....			
Unit Heater Group—Total	\$1,046,558	\$ 562,401	\$ 2,633,813
Industrial Type Unit Heaters, including heating element and motors where furnished—			
Equipped with blower-type (centrifugal) fans... ..	177,528	78,761	407,410
Equipped with propeller-type fans	319,271	184,644	956,306
School Room Type Unit Heaters, including heating element and motors and control where furnished			
Indirect Heating Surface (not including unit heater surface)—			
Steel pipe coil type (manufactured or jobbed)....	7,828	1,291	20,471
Cast iron type (manufactured or jobbed).....	15,034	28,399	40,569
Copper or aluminum type (manufactured or jobbed)	329,687	138,736	770,071

*Includes incidental equipment, such as temperature, controls, dampers, outlets, etc., as are sold with each.

THE BUYER'S GUIDE



Expert REBUILDING & REPAIR

General Electric MONITOR TOP UNITS \$25
All Household Models

MAJESTIC HERMETIC UNITS—\$30.50
SERVEL HERMETIC UNITS—\$18.50

P.O.B. OUR FACTORY
One Year Unconditional Guarantee

A complete rebuilding and replacement service. All units tested for temperature, cycling, wattage consumption and quietness. Thousands of units rebuilt in past seven years. We guarantee satisfaction.

REFRIGERATION MAINTENANCE CORP.
365 EAST ILLINOIS ST. — CHICAGO, ILLINOIS

PARTS-SUPPLIES-TOOLS for REFRIGERATION-AIR CONDITIONING

Complete Stock—Quick Service

NEW 1937 CATALOG

JUST OFF THE PRESS

Write Today for Your Copy

AIRO SUPPLY CO. 2739 N. Ashland Ave., CHICAGO
17 West 60th Street, NEW YORK

ALL YOUR NEEDS FROM ONE SOURCE

SEND FOR BIG FREE CATALOG

NOW READY ! ! !

CATALOG NO. 11

COMPLETE COVERAGE ATTRACTIVE PRICES

BE SURE YOU GET YOUR COPY

H. CHANNON CO.

133 N. WACKER DRIVE CHICAGO, ILL.

BACK TO ZERO IN A JIFFY!

—and actually
RECALIBRATED at the same time

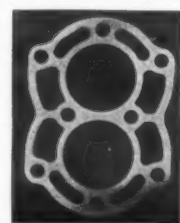
THE Marsh "Recalibrator" is the greatest improvement ever devised for gauges used in test work and other services where the punishment is severe. When the gauge is knocked out of adjustment, you don't pull the hand off and put it back on so that it reads zero—because that merely throws all the readings off. With the Marsh "Recalibrator" you simply turn an adjustment screw and presto!—the gauge is reset throughout the ENTIRE RANGE.

JAS. P. MARSH CORPORATION, 2067 Southport Ave., Chicago, Ill.

MARSH Refrigeration Instruments

SHELL AND TUBE CONDENSERS AND WATER COOLERS

CLEANABLE
JACKSON
ACME INDUSTRIES, INC. MICHIGAN
ALL SIZES EFFICIENT FAST DEPENDABLE COMPACT ECONOMICAL OPERATION



PIONEERS and SPECIALISTS in GASKETS for ELECTRIC REFRIGERATION

offer you Metallic Gaskets that hold regardless of what your refrigerant may be and will not shed particles of material to clog up important working parts in a machine. A metal that will not "creep." Once tight it will stay "tight."

"Send for NEW complete catalog"

CHICAGO-WILCOX MFG. CO.
7701 S. AVALON AVE. CHICAGO, ILL.



RECEIVER TANKS—COMPRESSOR BASES—MOTOR MOUNTING BASES—AND OTHER STAMPINGS AND ASSEMBLIES FOR REFRIGERATION AND AIR CONDITIONING.

Our Receiver Tanks are made with drawn shells. Assembly by Hydrogen Brazing produces tanks chemically clean and free from dirt. Can furnish tanks painted if desired.

Brased in Controlled Atmosphere

Acklin

THE ACKLIN STAMPING CO.
TOLEDO, OHIO
Chicago, Ill.
Detroit, 2-165 Gen. Motors Bldg.

REFRIGERATION NEWS

Trade Mark Registered U. S. Patent Office. Established 1926 as Electric Refrigeration News
Member Audit Bureau of Circulations. Member Associated Business Papers.

VOL. 21, No. 3, SERIAL NO. 426
ISSUED EVERY WEDNESDAY

Entered as second-class
matter Aug. 1, 1927

DETROIT, MICHIGAN, MAY 19, 1937

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Business News Pub. Co.

FOUR DOLLARS PER YEAR
TWENTY CENTS PER COPY

3-Month Sales In Philadelphia Reach 18,305

Household Unit Sales
Up 32% over Same
Period of 1936

PHILADELPHIA—Sales of household electric refrigerators in the Philadelphia metropolitan district during the first three months of this year totaled 18,305 units, an increase of 32% over the 13,857 sold during the first quarter of 1936, reports George R. Conover, managing director of the Electrical Association of Philadelphia.

Retail value of sales for the quarterly period is \$3,171,313, a rise of 27% over the \$2,487,745 reported for the first three months of 1936, according to the association's figures.

A significant factor of the report is the drop in average unit retail price from \$179 last year to an average of \$173 for the 1937 quarter, despite the 27% rise in retail sales value over the same period.

The report also reveals that sales in the Philadelphia area for the first three months of the present year are

Enamel Shop Practices Discussed at Forum

CHAMPAIGN-URBANA, ILL.—A 110% increase in 1937 business in the porcelain enameling industry over 1932 figures while general business is showing a 40% rise was predicted at the first annual Porcelain Enamel Institute Forum, held at the University of Illinois here May 5, 6, and 7, by E. L. Lasier, vice president of the institute's educational bureau.

In his paper, "The Institute and the Enameler," Mr. Lasier noted that first quarter activity in the industry indicates a sharp rise over 1936 business when a 66.7% increase over 1932 figures was shown. In 1933, the increase was only 6.7%, while in 1934 and 1935 rises of 17.1% and 48.7% were recorded.

With an official registration of 215 enamellers and students from all parts of the country, the forum was said to be the most successful project ever conducted in the industry's history.

In response to a welcome by Dean H. H. Jordan of the University of Illinois Mr. Calton proposed that an "internship" be created for ceramics students who desire to affiliate themselves with plants in the porcelain enameling industry.

"It might be well," Mr. Calton said, "if we are to have real cooperation between the industry and the colleges offering courses in ceramics, for us to provide some definite means whereby undergraduates can be placed in the industry before obtaining their degrees."

The second session of the forum, which was opened Thursday morning, May 6, by Mr. Calton, was devoted to discussions of testing, design, and the reduction of shipping losses.

(Concluded on Page 21, Column 1)

Brooklyn Group to Bar Code Violators

BROOKLYN—Under the 10-point fair trade practices code adopted by resolution at a recent meeting of the Electrical Appliance Dealers Association of Brooklyn, Inc., any member found guilty of violating provisions of a distributor contract under the Feld-Crawford Act, will have his membership in the league revoked.

Copies of the following code and resolution, signed by Martin A. Tarzian, chairman of the board of

(Concluded on Page 2, Column 4)

3-Cent Daily Average Current Cost Shown in Public Test in Capital

WASHINGTON, D. C. — Average operating cost of less than 3 cents per day on electric refrigerators is being featured by the Electric Institute of Washington in its advertising and promotion, as a result of a 30-day public test conducted on 12 nationally known makes of 1937 model refrigerators, made under conditions simulating Washington's hottest week last year, and checked by more than 75,000 visitors to Institute headquarters.

Designed to sell the public on the virtues of electric refrigeration as an industry rather than on individual makes, this unusual public demonstration checked the refrigerators for kilowatt-hour consumption, maintenance of temperature under varying weather conditions, ice-freezing capacity, and general performance of the units under conditions considerably more rigid than would be expected in a prospective owner's home.

Primary object of the test was to permit the public to prove to itself

that, regardless of manufacturers' claims of superior performance, all electric refrigerators maintain safe inside cabinet temperatures under varying weather conditions, and consume a very small amount of electricity.

Six Institute-approved refrigerators were tested for a 15-day period, after which time six others were substituted for the duration of the demonstration.

During the 30-day period, 208 kilowatt-hours were consumed, or an average of 6.97 kilowatt-hours daily for six refrigerators. Average current consumption per unit per day was 1.16 kilowatt-hours, less than 3 cents at prevailing Washington rates.

Housed in an insulated room 10 x 16 feet, erected in the main lobby of the Potomac Electric Power Co. building, the refrigerators were under continuous operation in temperatures ranging between 70° and 105° F., simulating daily conditions as shown

(Concluded on Page 8, Column 3)

Mahan, Bolin Promoted By Westinghouse

MANSFIELD—S. D. Mahan, formerly manager of merchandise advertising of Westinghouse Electric & Mfg. Co., has been appointed general advertising manager of the company.

In his new post, Mr. Mahan will have general supervision over all advertising and sales promotion work of Westinghouse and its subsidiaries.

His headquarters will be in Mansfield, where the merchandising division of the company is located.

Succeeding Mr. Mahan as merchandise advertising manager will be Roger Bolin, who has been associated with the advertising and sales promotion activities of the company since joining the Westinghouse organization in 1925, at East Pittsburgh. For the past few years he has been in Mansfield, where he will continue to headquarter.

Mr. Mahan has been directing advertising and sales promotion activities in advertising agencies and industrial companies for more than 20 years. Starting in Cleveland, he was first associated with the H. K. McCann Co. there and in Toronto, Canada.

Returning to Cleveland in 1924, he was with the Roger Williams Co. and later with Fuller & Smith & Ross, advertising agency, becoming vice president and Cleveland office manager. Then he became vice president of the Greenleaf advertising agency, Boston, leaving that organization in 1933 to join Westinghouse as merchandise advertising manager.

Utica Association Sets Trade-In Maximums

UTICA, N. Y.—Agreeing to cooperate with the Utica & Mohawk Valley Radio & Appliance Dealers' Association under provisions of the Feld-Crawford Act to stabilize prices on electric and gas appliances, 25 member dealers have set maximum trade-in allowances on ice boxes and have joined in a \$1,000 educational advertising campaign on electric refrigeration.

At a recent meeting of the association, the 25 cooperating outlets unanimously agreed to set a \$5 maximum on trade-ins of wood boxes and limited the trade-in allowance on steel boxes to \$7.50.

A series of 12 large advertisements designed to educate the buying public and to further trade relations locally has been embarked upon by the Utica association with the cooperation of the Utica Gas & Electric Co., local utility, according to G. P. Moore, secretary of the dealers'

(Concluded on Page 2, Column 2)

Sterling Heads Nema Promotion Division

HOT SPRINGS, Va.—James A. Sterling, advertising and sales promotion manager for Norge division, Borg-Warner Corp., was appointed chairman of the advertising and sales promotion division of the Household Section of the Refrigeration Division of National Electrical Manufacturers Association (Nema) at its meeting here Monday, May 17.

Mr. Sterling succeeds Ray Cosgrove of Westinghouse Electric & Mfg. Co.

The meeting was one of the best attended in recent years, with most of the leading refrigeration manufacturing concerns represented by a number of top executives. The Commercial Section of the Refrigeration Division met Monday.

Next meeting of the division will be held Aug. 10 in Mansfield, Ohio.

Cleveland Dealers Fight Discounts

CLEVELAND—Denouncing as a "million dollar racket" the giving of retail discounts on electrical appliances, 125 members and guests of the Cleveland Retail Appliance Dealers Association at a dinner meeting May 12 adopted preliminary plans for a cleanup of trade practices in the city and heard three dealers pledge cooperation in fighting price-cutting.

Ralph H. Jones, secretary of the Electrical League of Cleveland, branded the giving of discounts as a racket in which consumers are annually handed a 10% "rake-off" on legitimate electrical merchandise to promote business, and urged dealers to devote more time to selling and less to cutting prices to undersell competitors.

During 1936, said Mr. Jones, Cleveland appliance dealers did a \$15,000,000 business, of which about 10%, or \$1,500,000, was "graft" discounts. These deductions were se-

(Concluded on Page 28, Column 4)

60 Air-Conditioning Jobs Sold in April in Chicago

CHICAGO—Sixty air-conditioning systems were contracted for in the Chicago territory during April, according to statistics compiled by the air-conditioning department of Commonwealth Edison Co. The jobs totaled 1,008 tons of refrigeration, and represented a connected load of 1,044½ hp.

Restaurants led in number of systems contracted for during the

(Concluded on Page 19, Column 4)

J. A. Harlan Elected President Of ACMA at Spring Meeting

ACMA President



J. A. HARLAN

Detroit Advertising Code Bolstered

By James A. McCallum

DETROIT—Pressure brought to bear by the newly formed Detroit Appliance Dealers Association has already resulted in stringent reformulation of the Better Business Bureau's advertising code for household appliance merchandisers, and a consequent decrease in false and misrepresentative appliance advertising in local newspapers, Carl Lass, executive secretary of the association, told more than 40 appliance dealers at an open meeting May 13 in Hotel Webster Hall.

Mr. Lass also outlined the results of his recent conference with distributors in this territory, when he explained the purpose of the dealer association and asked the distributors to cooperate to the greatest possible extent in the dealer association's program.

The dealer meeting was then opened to discussion, and it soon turned into a lively question-and-answer session concerning the association, its organization, and its policies.

Provisions of the Better Business Bureau's revised recommendation for appliance advertising follow:

"1. As provided under City Ordinance No. 706 A, Sec. 2., all dealers offering radios, refrigerators, wash-

(Concluded on Page 27, Column 2)

Jobber Directors to Meet In Detroit May 27

DETROIT—Directors of the Refrigeration Supplies and Parts Manufacturers Association will meet at 9 a.m., May 27, at the Statler hotel here, it was announced last week by Frank J. Gleason, secretary of the association.

The meeting is by no means restricted to directors, and any member of the association may attend, Mr. Gleason declared.

At the meeting the jobbers will discuss business conditions in the parts industry, and discuss plans for the second annual convention of the association, to be held the first week in November in Chicago.

239,413 Norge Products Sold in 4 Months

DETROIT—Norge household shipments for the first four months of this year totaled 239,413 units; a gain of more than 26% over the 190,568 units shipped during the same period last year, reports Howard E. Blood, executive vice president of Borg-Warner Corp.

April Norge all-product unit sales totaled 67,562, compared with 57,992 units in the same month of 1936, Mr. Blood added.

Washer sales showed an increase

(Concluded on Page 2, Column 5)

Henderson Reports Many Requests for Product Information

By F. O. Jordan

HOT SPRINGS, Va.—J. A. Harlan, commercial sales manager of Kelvinator division of Nash-Kelvinator Corp., was elected president of Air-Conditioning Manufacturers' Association during that organization's annual meeting here May 14 and 15.

William H. Price, Jr., vice president of Carrier Corp., was elected vice president of the organization; and P. A. McKittick, general manager of the Parks-Cramer Co., was named treasurer.

Directors are the officers and W. F. Armstrong, assistant general manager of the Delco-Frigidaire conditioning division of General Motors Sales Corp.; P. Y. Danley, manager of the refrigeration and air-conditioning department of Westinghouse Electric & Mfg. Co.; J. J. Donovan, manager of the air-conditioning department of General Electric Co.; Stewart E. Lauer, vice president of York Ice Machinery Corp.; and J. F. G. Miller, vice president of B. F. Sturtevant Co., and president of the association last year.

William B. Henderson will continue as executive vice president of ACMA, and William Shaw, Chicago, has been retained as publicity counsel.

Sessions of both ACMA and Refrigerating Machinery Association (RMA), which met here May 12 and 13, were closed to all save members of the two groups. Announcements of the successive steps in the year's program will be made, it was said, as they are put into effect.

Sharp upturn in the number of inquiries for air-conditioning information being received at ACMA headquarters in Washington was announced by Mr. Henderson, who also said that progress had been made in research work on the health aspects of air conditioning.

The program of seasonal themes, inaugurated last year for use in the advertising of members and suppliers, was adopted so generally and successfully as a united selling front that a similar schedule of copy appeals has been prepared for the rest of 1937, Mr. Henderson said.

Although transactions of convention sessions proper were not made public, opinions as to the probable future course of the air-conditioning industry were obtained from several of the prominent personages present.

For example, Willis H. Carrier, chairman of Carrier Corp., says that, barring unforeseen breaks in the industrial continuity, the curve of air-conditioning sales should continue upward for about five years. At the present rate of growth, Mr. Carrier states, that volume is just about doubled every two years, following the mathematical laws of geometrical progression.

He bases this prediction largely upon the absorbing capacity of the medium size commercial field, with increasing help from domestic or "package" unit air conditioner sales.

At the end of the five year period, he thinks, the ability of the curve to continue its upward trend will depend upon whether or not public acceptance of the domestic type of air conditioner is sufficient to "take up the slack" in the total volume curve, which otherwise will develop as the saturation point of the market for commercial air conditioning is approached.

Mr. Carrier estimates the total gross income of American air-conditioning manufacturers at 42 million dollars for 1936, including income from manufacturing operations and from such installation work as was done by manufacturers themselves.

(Concluded on Page 13, Column 2)

Retail Price of Units Sold by Philadelphia Dealers Averages \$173

Month	1937 Units Sold	1936 Units Sold	1935 Units Sold	1937 % Increase or Decrease over 1936	1937 Retail Value	1936 Retail Value	1937 % Increase or Decrease Over 1936	1937 Average Price	1936 Average Price
January	3,135	2,532	718	+ 24%	\$ 524,071	\$ 456,989	+ 15%	\$167	\$181
February	6,119	3,657	2,634	+ 67%	1,076,607	681,667	+ 57%	175	186
March	9,051	7,668	6,357	+ 18%	1,570,635	1,349,089	+ 16%	173	176
Totals	18,305	13,857	9,709	+ 32%	\$3,171,313	\$2,487,745	+ 27%	\$173	\$179

Utility Sales

Month	1937 Units Sold	1936 Units Sold	1935 Units Sold	1937 % Increase or Decrease over 1936	1937 Retail Value	1936 Retail Value	1937 % Increase or Decrease Over 1936	1937 Average Price	1936 Average Price
January	96	81	53	+ 19%	\$ 18,290	\$ 16,718	+ 9%	\$190	\$206
February	191	160	104	+ 19%	36,658	29,623	+ 23%	192	185
March	457	372	302	+ 23%	87,763	70,191	+ 25%	192	188
Totals	744	613	459	+ 21%	\$ 142,711	\$ 116,532	+ 22%	\$192	\$190

Note: Utility sales approximate 4% of total sales.

Report covers sales in Philadelphia, Bucks, Montgomery, Delaware, and Chester Counties.

Report includes sales of the following makes: Apex, Coldspot, Crosley, Frigidaire, Copeland, G-E, Grunow, Hotpoint, Kelvinator, Leonard, Norge, Sparton, Stewart-Warner, Universal, and Westinghouse.

Philadelphia Group's Spring Show Replaced By Special Campaign

(Concluded from Page 1, Column 1) practically double those made during the same period in 1935 when 9,709 units were sold.

Sales made by Philadelphia Electric Co. for the quarter total 4% of all sales made. The utility sold 744 units during this time, an increase of 21% over the 613 sold during the first three months of 1936. Retail sales value was \$142,711 as compared with \$116,532 for last year, an increase of 22%.

The utility's increases in total sales percentages and total retail sales fell considerably below the general averages made by all city dealers, the report shows.

UTILITY PRICES UP

Average retail price of units sold by Philadelphia Electric Co. rose from \$190 during the first quarter of 1936 to \$192 for the first three months of this year, an average increase of \$2 per unit as compared with an average drop of \$6 per unit in non-utility sales.

Sales this year reached their peak in March when 9,051 units were sold. This figure represents almost half the total sales for the three months, and an increase of approximately 50% over February sales.

In the absence of the usual Electric Refrigeration Show held in previous years under the sponsorship of the Electrical Association of Philadelphia, a special advertising campaign is now being run in city newspapers, both daily and Sunday.

This campaign, which began April 4 in the *Record and Inquirer*, will be continued throughout June with 500-line insertions in these two papers and in the *Ledger and Bulletin*.

TWO THEMES USED

Two separate themes—factual and human interest—are being employed in the new advertising program, according to Mr. Conover.

One advertisement definitely states in text and portrays by symbolic illustrations that every other home in the Philadelphia area now has electric refrigeration. Another advertisement in this class states that every other minute of the business day, somebody in the city buys an electric refrigerator.

The "human interest" advertising program incorporates several styles of copy and illustrations showing babies and small children asking for the protection of electric refrigeration or commending its efficiency in preserving their food at proper temperatures.

As an additional feature of its advertising program, the association has contracted for 24 painted wall advertisements located at various prominent points throughout the metropolitan area. Formerly outdoor posters placed for one month only

were used. The painted advertisements will remain for six months.

In making a change from the conventional outdoor posters, the association was guided by the superior durability of the painted advertisement and the fact that its story remains before the buying public for a longer time, the association's report states.

Utica Dealers Sponsor Educational Campaign

(Concluded from Page 1, Column 2) group. A total of \$1,000 has been subscribed for the campaign.

Advertising copy used in connection with the campaign appears without the names of cooperating dealers, the name of any one make of electric refrigerator, or the name of the Utica & Mohawk Valley Radio & Appliance Dealers' Association. Educational promotion of electric refrigeration is the main objective of the advertisements, says Mr. Moore.

The following dealers and distributors in the Utica territory have agreed to cooperate under terms of the Feld-Crawford Act in fixing and maintaining prices on electric and gas appliances:

Burton's Stove Store; Drescher's Furniture Co.; Goodman's Home Furnishers, Inc.; J. Graziano & Bro.; Harris Bros. & Co., Inc.; H. G. Hatfield Electric Corp.; Hesse-Schnitt, Inc.; Kempf Bros.; F. B. Koster; Lincoln Furniture Co.; Markson's Furniture Co.; Lockner's, Inc.

H. D. Morehouse & Son; John Owens; Ribyat Bros., Inc.; Roberts Hardware Co.; Rock's Tire & Battery Shop; Schwenders, Inc.; Sears, Roebuck & Co.; Sonne Bros.; Utica Home Heating Co.; Utica Household Furniture Co.; Utica Radio Supply Co.; John Williams (Yorkville), and E. B. Worden & Co.

COPPER TUBING



for
AIR CONDITIONING

The neatest, quickest leakproof installation demands Wolverine Copper Tubing with wrought fittings (any make you choose—Wolverine fits them all). Wolverine Copper Tubing made to Government and A.S.T.M. Specifications.

Your jobber can supply you.

WOLVERINE TUBE CO.
1411 Central Avenue
DETROIT, MICHIGAN



"Yes, that's right—Copelands. We tried them in three of our stores and the results were so completely satisfactory that we now have installed them throughout our entire chain."

That's the way Copeland users talk. And that's why Copeland Commercial Refrigeration units are so easy to sell.

Write for our Sales Plan

COPELAND

REFRIGERATION CORPORATION . . . DETROIT, MICHIGAN

Terms of Brooklyn Dealer Agreement

(Concluded from Page 1, Column 1) directors, and Russell A. Atkinson, president, have been sent to the association's members and to manufacturers and distributors:

"Resolved, that we the members of the Brooklyn Electrical Appliance Dealers Association, do hereby adopt the following fair trade practices covering our conduct under contracts made under the provisions of the Feld-Crawford Act.

"The dealer agrees:

"1. To sell at prices set by the manufacturer or distributor.

"2. Not to give any bonus, credit, or premium stamps, presents, or kickback or any description in connection with the sale of merchandise under provisions of the Feld-Crawford Act.

"3. To sell under the Feld-Crawford Act separately and not in combination of merchandise.

"4. To give only a reasonable and proper trade-in allowance which in no event shall exceed the amount stipulated by the manufacturer.

"5. Not to transship or to sell to any other dealer in the State of New York except at the full cash selling prices as set by the manufacturer or distributor of merchandise, protected by Feld-Crawford contracts.

"6. To cooperate with the manufacturer or distributor of trade marked or branded merchandise in adjusting any complaints in an amicable manner.

"7. To cooperate with the manufacturer or distributor in the sale of trade marked or branded articles.

"8. Not to offer in any manner to any person merchandise not covered by the Feld-Crawford contracts at less than the cash selling prices.

"9. To fully cooperate with the Fair Trade Act Committee of this association and to submit to arbitration any complaint made in connection with any violation of Fair Trade Practice.

"10. Dealers approve and agree to the shopping service of the association and if found guilty of violating any of the provisions of the Feld-Crawford contract, consent to expulsion from membership in the association, and further consent that the association may incur the expense, in enforcing the claims of any member injured by reason of any violation of Feld-Crawford contracts."

Norge Appliance Sales Show Big Increase

(Concluded from Page 1, Column 4) of 59% for the year's first four months, while washer shipments for the industry as a whole were up only 11% during the first quarter, he said. Sales of Norge furnaces for the four months gained 157%, compared with last year; oil burner sales were up 113%; commercial refrigeration installations, 124%, and ranges, 19%.

Norge open orders at the end of April for all products exceeded total shipments for the same month of 1936, and represented 99% of April sales, Mr. Blood stated.

Sales increases so far this year are attributed by Mr. Blood largely to the increased buying power of higher employment and wages.

NEW MODERN DESIGN

INCREASED CAPACITY

ECONOMICAL OPERATION

FINISH PROTECTED BY BONDERIZING

Don't Neglect **THIS IMPORTANT SALES FEATURE**



Standing out among other vital sales features is the matter of finish stability and rust prevention.

Whether or not the finish endures for the life of the cabinet and retains its white, gleaming brilliance, is important to the buyer. The Bonderized unit gives the salesman an opportunity to capitalize on this very human desire for continued fine appearance.

Every prospect is impressed with extra value provided by Bonderizing under the enamel. That it provides better adhesion of finish to metal gives

you an extra quality feature that should not be overlooked by the thorough salesman.

Bonderizing gives the metal an absorbent coating that holds the finish, protecting against chipping or peeling, and consequent corrosion. Rust will not spread around accidental scratch or mar on the Bonderized cabinet.

Bonderizing should be mentioned in every demonstration.

PARKER RUST-PROOF COMPANY
2197 E. Milwaukee Ave. Detroit, Michigan



Ask for this Book

It shows what a salesman should know about Bonderizing, with charts and description of tests made on Bonderized metal. Arms you with vital sales facts that help close deals.

PARKER
Processes **CONQUER RUST**
BONDERIZING · PARKERIZING

R. C. Cameron Promoted To Specialty Sales Post at G-E

CLEVELAND—Promotion of Ralph C. Cameron to assistant manager of the Specialty Appliance Sales Division of General Electric Co. has been announced by G. J. Chapman, division manager.

In addition to his new duties, Mr. Cameron will continue his interest in developing sales of General Electric kitchen appliances through department and furniture stores, regarded by him as an increasingly important channel of distribution.

A series of rapid promotions has come to Mr. Cameron since his association with G-E sales activities, most recent of which was appointment as head of the department store division of the Appliance and Merchandise Department of the company. Prior to that he had been the department's assistant sales manager.

Coming to the G-E Cleveland organization in 1932 from a position as wholesale manager of the Canton, Ohio, distributorship, Mr. Cameron was placed in charge of department store activities for the refrigerator, and later for the range, dishwasher, and other G-E kitchen appliances. Then his activities were widened to cover all appliances.

G-E's Specialty Appliance Sales Division is responsible for production, distribution, advertising, and sale of household and commercial refrigeration, ranges, dishwashers, Disposalls, and the G-E unit kitchen.

F-M Dayton Distributor Appoints Eight Dealers

DAYTON—Appliances, Inc., Fairbanks-Morse distributor, has appointed eight new dealers, according to Clyde Graham, local manager.

Dealers and their locations are: Brown Furniture Co., Dilgarde Distributing Co., and National Outfitting Co., all of Dayton; Wilson Hardware Co., Washington C. H.; Wilkins Hardware Co., Minster; Bond Furniture Co., Middletown; Alvin Hedges, Hillsboro; and Variety Gift Shop, Mechanicsburg.

Apex Rotarex Corp. Adds Two Distributors for South

CLEVELAND—Two new firms have been added to the Apex distributing organization, according to Charles W. Smith, sales manager of Apex Rotarex Corp. here.

The Richmond Wholesalers, Inc. of Richmond, Va., will handle Apex distribution in Richmond and surrounding territories, and the Lovejoy Co. of Jacksonville, Fla., will act as distributor in the northern counties of Florida and parts of Georgia.

200 Cincinnati Area Grunow Dealers Attend Dinner

CINCINNATI—Two hundred Grunow refrigerator dealers and salesmen from this city and neighboring territory recently attended a dinner at Hotel Gibson where three new 1937 refrigerators were displayed.

Speakers at the dinner were Harry Alter, sales manager, James J. Davin, sales promotion manager, and Robert E. Kane, district representative, of General Household Utilities Co., Chicago.

Hosts to the convention were C. W. Hyde, vice president, and W. H. Crusey, sales manager, of Griffith Distributing Corp., Cincinnati.

Toubman & Sons, Inc., Opens Remodeled Showroom

HARTFORD, Conn.—William Toubman & Sons, Inc., Norge and Universal dealer, has opened its newly-remodeled store at 705 Maple Ave. A "one-stop" all-electric kitchen, special exhibits, demonstrations, and moving pictures were features of an "open house" held May 1-8.

Tyler Takes Partnership In Cheyenne Store

CHEYENNE, Wyo.—Rudy J. Tyler, sales manager of Woodley-Hanes, Inc., electrical goods store, has purchased the interest of Harold H. Hanes in the establishment. The name of the firm will be changed to Woodley-Tyler, Inc. Howard Woodley is the other member of the reorganized firm.



THERE ARE QUITE A FEW important dealers throughout the country now offering their customers Cordley Water Coolers. These men know that a Cordley dealership enables them to make a certain, respectable profit for themselves and still have their retail prices strictly competitive. They know they are selling a quality product conceived out of nearly fifty years of water-cooling engineering skill and experience. They know that Cordley Coolers are styled in a handsome modern manner and not as "hardware" or freakishly modernistic. Without a "price-leader" in the line, these dealers know that every cooler bearing the name Cordley represents full profit to him and full satisfaction to his customers. And these dealers are not keen for vaguely worded, so-called long-term "guarantees" which often mislead and usually mean undue responsibility for the dealer. But they do like Cordley's easily understood, printed year's guarantee because they know that such great organizations as Remington Rand, Sun Oil, Sweet Orr Overall, Sears Roebuck, Pacific Mills, American Optical, General Foods, and many others, who use hundreds of Cordley Coolers, constantly re-order and recommend Cordley, and they wouldn't do that unless Cordley Coolers gave consistent, uninterrupted and economical service. 1937 is a big Cordley year. Sales records are being broken every day. We want a few additional good dealers able to serve the worth-while "quantity" markets such as factories, large offices, banks, hotels, clubs, etc. You want a real profitable line. Why not write—now—and we'll give you full details by return mail. **CORDLEY & HAYES, 157 Hudson Street, New York City.**

The five Cordley Water Coolers shown on this page are representative models of the complete Cordley line of package type coolers . . . a distinct advantage to dealers in meeting all types of installations and cooling requirements. Note that both pressure and bottle styles are available; equipped with bubbler, faucet, goose-neck or push-back glass fillers. The Cordley cabinets combine good looks with compactness, the smaller size requiring only 15-1/2" of floor space; the larger, 16-1/2" x 21-1/4".



Cordley

WATER COOLERS

SUCCESSFUL SALES IDEAS

Indiana Dealer's "Sales Balancing" Duo



Both General Electric major appliances and Chrysler-Dodge cars are sold in this attractive showroom of R. L. Holben, Auburn, Ind.

Selling Appliances in Conjunction with Automobiles Makes Dual Profits for Holben Co., Chrysler & G-E Dealer

AUBURN, Ind.—Selling electric household appliances in conjunction with automobiles has proved a profitable practice for the R. L. Holben Automobile Co., local Chrysler-Dodge dealer and holder of the General Electric franchise on major appliances.

Autos and appliances, which include G-E refrigerators, electric ranges, and washing machines, are displayed together on the same floor, sold by the same salesman, and in many cases bought by the same purchasers.

The products are ideal companions, says Mr. Holben, the sale of one very often leading to the sale of another, and the off-season of one being balanced by the good season of another.

Concrete proof that the appliances and the automobiles suit each other as sales balancers was produced during the recent strike in the automobile industry which tied up shipments of cars.

Holben's had neither Chryslers nor Dodges to sell for two or three weeks; so all efforts were turned to the selling of appliances. Business was kept booming until the strike settlement permitted delivery of automobiles.

So complementary are the automobile, the refrigerator, the electric range, and the washer that Holben's employs no flamboyant advertising, uses no high pressure sales methods. Instead, the company relies on customer satisfaction to produce sales.

To create customer satisfaction, the firm stresses its "We Hurry" slogan.

Not long ago, Holben's sold an electric range and an 8-cu. ft. refrigerator to a customer who wanted them installed in the new home to which he was moving next day. Both units were immediately delivered to

the house, connected, and were ready for use when the customer moved in.

In return for this prompt service, Holben's was able to sell three refrigerators and two electric ranges within a week to friends of the satisfied customer.

To further the "We Hurry" principle, Holben's has made one of the shop mechanics a licensed electrician.

"We can hook up a range \$10 cheaper with our own licensed electrician," Holben says.

The "We Hurry" slogan is one of four basic policies upon which Holben's highly profitable business has been built. The other three are enthusiasm for the product, maintenance of a complete stock of units, and meeting the customer's needs.

One bugbear that has troubled Holben is the trade-in problem. His policy has been, and continues to be, to lose a sale rather than try to meet a competitor's trade-in offer which does not permit a profit.

It was less than three years ago that Holben began selling household appliances. When the franchise was first offered him, he declined to accept it, because he knew absolutely nothing about the appliance field. Later he took the franchise, and proceeded to inform himself and his staff on the selling methods best suited to the refrigerator, range, and washer. During the first year, the company sold 25 units. Next year the total reached 75. This year Holben expects to sell about 225 units, many of them to farmers.

Rural electrification is rapidly being extended around Auburn, creating a new and potentially prolific field for sales. Farmers affected by the power development are quite prosperous, states Holben, and their needs cover a wider range than those of the average city customers.

Brown Supply Boosts Dealers with Folder To Streetcar Riders

ST. LOUIS—To boost dealer sales, Brown Supply Co., Grunow distributor here, is distributing to street car riders a four-page sales folder employing newspaper style make-up, in which a free gift offer, an economy sales story, and the dealer's store name are tied in.

Presentation of the coupon on the back of the folder and 10 cents to the dealer whose advertisement is contained therein, entitles the bearer to a jar opener valued at 75 cents.

Approximately one million copies of the 8x11-inch size promotion piece, called "The Grunow Guide to Refrigeration Economy," are being distributed in street cars throughout the city. The Grunow dealer (or dealers) in the neighborhood through which the street car line runs is given the promotional plug in the folders supplied in cars on that line.

First page of the folder plays up the Grunow economy story by relating the results obtained by Margaret Sawyer, a nationally known authority on foods, in making a series of comparative tests on a 1937 Grunow and three other leading makes of refrigerators.

Centered by a picture of a 1937 Grunow, the double page inside spread of the folder plays up leading sales features, and offers "Terms as low as 15 cents a day for air-conditioned refrigeration."

Consistent Follow-up Pays, Marcus Finds

JANESVILLE, Wis.—It pays, in the long run, to keep on patiently contacting prospects that can't yet afford to buy, says D. J. Marcus of Wisconsin Electric Sales Co., Westinghouse dealer. He claims that, as the result of such a policy, the company's refrigerator sales for 1936 were double those for 1935.

When he was first appointed Westinghouse refrigerator dealer in 1931, Mr. Marcus and his salesmen spent much of their time and effort calling on people who were too "hard up" to be immediate buyers.

But such prospects were made familiar with the company's line, and as their earning powers increased, many of them have purchased appliances from Wisconsin Electric Sales Co.

Mr. Marcus believes in handling only one make of refrigerator and concentrating all sales effort on it. He uses newspaper advertising to back up cold canvassing and pays all his salesmen on a straight-commission basis.

CONDENSERS
COMMERCIAL EVAPORATORS
DOMESTIC EVAPORATORS
COMFORT COOLERS
MARKET COOLERS
AIR CONDITIONING SURFACE
UNIT HEATERS
BLAST HEATING SURFACE

McCORD

REFRIGERATION AND
AIR CONDITIONING
PRODUCTS

CATALOGUES ON REQUEST

McCORD RADIATOR & MFG. CO.
DETROIT, MICHIGAN

Well-Advertised Contests One of Best Ways to Gain Attention, Hill Says

TOPEKA, Kan.—"Contests are one of the best ways we have found to gain public attention," says Ross W. Hill, manager of the electrical appliance division of Karlan's. "And consistent advertising featuring a series of these contests already has brought us a 21% to 29% increase in refrigerator sales over those of last year."

"Our records show," he continued, "that the largest percentage of the store's new customers are brought by the electrical department, so we feel that our advertising campaign for new trade is proving successful."

"We believe that a new customer comes into the store, the most important step has been taken, and that one of the best ways to obtain these new customers is through a series of contests. It doesn't matter much what the contest is, for the competitive angle alone is enough to attract attention."

"To keep this interest once it is aroused, we plan to run a series of three or four 30-day contests every year. We keep the public informed of these contests through regular newspaper and radio advertising."

Mr. Hill explained that his department recently sponsored an "Old Age" contest for washing machines which resulted in more refrigerator sales than washing machine business.

"This convinced us," he said, "that our principal problem in selling refrigerators was simply to keep the public aware of the appliance department."

Rules of the washer contest provided that each contestant come to the store to register his name, the make and age of his washer, the serial number, model, and any other available information. Gas-engine or hand-driven washers could qualify as well as electric providing they were still in actual use.

"Since this contest was the first of its kind to be held here for several years, it attracted considerable attention," Mr. Hill explained. And only a small percentage of the 185 entries had ever purchased anything from us. Due to widespread advertising people from outlying districts in various parts of the state came to register their machines."

Cash awards of \$35, \$20, and \$10 were offered. Winner of first prize was a 34-year-old hand-powered Minute washer with a wooden tub.

Cash Awards to Salesmen Push 'Slow' Models

DENVER—Cash awards to stimulate the sale of slower moving refrigerator models are being offered to its salesmen by Davis & Shaw Furniture Co., according to A. J. Wilson, manager of the electrical goods department.

Under the plan, an award of about \$2 in cash, depending on the model, is made to the salesman for each new refrigerator sale.

Particularly is the plan employed on "specials." But, when "specials" get to moving satisfactorily, the awards are placed on current models.

Durability

Bundyweld Tubing

BUNDYWELD Tubing is rolled from copper-coated steel. It is double-walled, copper finished on both sides, and electrically brazed into a dependable structure—unaffected by high temperatures and vibration. Its great strength has been conclusively proven in many bursting and vibration tests.

BUNDY TUBING CO.
DETROIT, MICHIGAN

Don't Close the Door
to EXTRA PROFITS

★ Don't forget to check the door gaskets when you service a refrigerator—particularly if it is five years or more old. The efficiency of thousands of refrigerators is threatened, today, because of time-worn gaskets. If you are on the lookout for extra profits, now is the time to capitalize on this new and ever-growing replacement business.

No costly equipment or material stocks are required. The simplified Miller line of 20 gasket types enables you to service 80% of all refrigerators ever made. Order them according to your needs. Complete warehouse stock insures immediate delivery.

As the first step towards getting your share of this profitable business, send for illustrated price list. If your local jobber cannot supply you, write direct.

THE MILLER RUBBER COMPANY, INC.
Akron, Ohio

IMMEDIATE DELIVERY

Miller

"Engineers in Rubber"

Greenwood & Beekman Head Hotpoint N. Y. & Philadelphia Areas

NEW YORK CITY—Heman Greenwood, longtime member of the Hotpoint organization, has been appointed New York district sales manager for Edison General Electric Appliance Co., Chicago, succeeding M. H. Beekman, who goes to Philadelphia as sales manager of the newly created Philadelphia district.

The new Philadelphia district includes: New Jersey, eastern Pennsylvania, Maryland, Delaware, and portions of Virginia, West Virginia, and District of Columbia. The northern portion of the former New York district, including the entire states of New York, Rhode Island, and Connecticut, remains under the jurisdiction of the New York office.

Before assuming his new post, Mr. Greenwood had served Hotpoint both at home and abroad for nearly a score of years. He once headed the company's sales organization in Brazil, where he was instrumental in introducing electric cookery into the tropics.

Taubeneck Addresses Philadelphia ASRE

PHILADELPHIA—At their May meeting, last of the current spring series, members of the Philadelphia section of the American Society of Refrigerating Engineers heard an address on "The Future of Air Conditioning" by Editor George F. Taubeneck of AIR CONDITIONING AND REFRIGERATION NEWS.

The following officers, elected in mail ballot, were invested at the meeting:

Chairman, A. F. Saunders, Quaker City Cold Storage Co.; vice chairman, Cecil Boling, Melchior, Armstrong, Dessau Co.; secretary-treasurer, H. M. Roberts, Philadelphia Gas Works Co.

Grunow to Display 1938 Radio Line May 24, 25

CHICAGO—Annual convention of Grunow radio distributors will be held May 24 and 25 at the Medinah Athletic Club. The 1938 line of Grunow radios and the new merchandising plans and policies of General Household Utilities Co. for the 1937-38 season will be presented during the session.

Range & Water Heater Sales Up 100% in West Penn Area

PITTSBURGH—Sales of electric ranges and water heaters in the territory of West Penn Power Co. totaled 476 units during the first three months of this year, an increase of more than 100% over figures for the same period of 1936.

Greensburg district led with 230% of quota for the period. Bellefonte was second, with 216%, and Emporium third, with 200%.

Kirby-Tuttle to Sell Frigidaire in Downtown Miami

MIAMI, Fla. — Kirby-Tuttle Co., Inc., has been organized to handle an exclusive downtown dealership for Frigidaire products.

Domestic Refrigeration Co., has withdrawn its downtown Frigidaire display.

Dolney & Schwartz to Retail G-E in St. Paul

ST. PAUL—Joseph Dolney and Ernest Schwartz have opened an appliance store in the Midway district and will handle the General Electric line. Both men have had 10 years' experience in household appliance merchandising and service at a local department store, it is reported.

Apex Appoints Daniels Wisconsin District Head

CLEVELAND—C. E. Daniels has been appointed district manager in the Wisconsin sales territory by Apex Rotarex Corp., manufacturer of Apex appliances here.

Mr. Daniels has just completed special sales work in New York City and will take over his new territory immediately.



REFRIGERATORS "on the cuff"

Even when a refrigerator is sold for cash, it is always delivered "on time." For it is only after delivery that the purchaser really begins to pay. Purchase is essentially the right to operate the refrigerator, and the cost of operation month after month is the cost of owning the refrigerator.

That cost can vary a great deal, depending upon the relative efficiency of the refrigerator. An important consideration in the cost of operation is the type of insulation in the walls. If that material is of high heat stopping value and resistant to moisture (non-hygroscopic) it will help keep the operating cost at a minimum.

But if the insulation is hygroscopic and absorbs moisture, its insulating value will be increasingly impaired and the cost of operation correspondingly increased.

Dry-Zero Insulation is the only commercial insulating material that is non-hygroscopic. Since it is also highest in insulating efficiency, it is obviously the best insulation.

If you are fortunate enough to be selling a Dry-Zero insulated refrigerator, you will know that the manufacturer has paid more for this better insulation to insure economical and satisfactory operation for the entire life of the refrigerator. Use this story in your sales talks. Dry-Zero Insulation in your refrigerator is one of your best selling points.

DRY-ZERO
INSULATION
The Most Efficient
Commercial Insulant Known

DRY-ZERO CORPORATION

222 North Bank Drive
CHICAGO, ILL.

687 Broadview Avenue
TORONTO, ONT.

INDUSTRY ACTIVITIES ABROAD

Merchandising Refrigeration in Prague



A recent visitor to the offices of AIR CONDITIONING AND REFRIGERATION NEWS was Joseph Horak of Horak Bros., refrigeration equipment manufacturers in Czechoslovakia. Mr. Horak left us the above picture, which shows Horak Bros. exhibit at The Fair in Prague. "Chladirny" means refrigeration, and the sign on the support on the left says "Who

talks about refrigeration talks about Horak," while the sign on the next set of pipes says "We make refrigeration only and we do it right." Mr. Horak's current visit to this country (during which he is contacting sources of parts) is his eighth. He is a member of the American Society of Refrigerating Engineers and Refrigeration Service Engineers Society.

700 G-E Domestic Washing Machines Shipped Abroad

BRIDGEPORT, Conn.—Seven hundred General Electric domestic washing machines, said to be the largest single export shipment of washers ever made, were shipped recently from Brooklyn on a 10,000-mile journey which will include travel by ocean vessel, plane, river steamer, and muleback.

Destination of the washers, which were manufactured here, was unannounced.

Among G-E officials at the pier to watch the shipment sail were John Wicht and J. K. Kay, sales manager and sales promotion manager, respectively, of the home laundry equipment division, and George Koch, of International General Electric Co., Schenectady.

Erbach Sails to Europe On Inspection Tour

BELOIT, Wis.—F. R. Erbach, vice president and chief engineer of General Refrigeration Sales Co., plans to sail from New York on May 19 aboard the Europe-bound S. S. Manhattan. Mr. Erbach will be accompanied by his wife.

The couple will spend two weeks traveling through the Rhine section of Germany, Switzerland, and France. Mr. Erbach plans to visit the refrigeration and air-conditioning displays at the Paris exposition, as well as to inspect many actual installations in the countries through which he travels.

Mr. Erbach is a delegate from Beloit Rotary club to the Rotary International convention to be held at Nice, Italy, sometime in June. After the convention, the Erbachs will travel through Italy before their return here about June 23.

THE MASTERCRAFT ADJUSTABLE PAD AND CARRYING HARNESS FOR SAFE DELIVERY OF AUTOMATIC REFRIGERATORS

Pad and harness ADJUSTABLE to many sizes and styles of cabinets. Economical—Efficient. Sturdy constructed, easily applied. Name of refrigerator attractively lettered on pad without charge.



Pad (Adjustable) \$9.50 ea.

Harness (Adjustable) \$6.00 ea.

The Pad and Harness are separate.

Individual carrying straps \$1.75 each and up. Write for 1937 Folder & Prices on entire Pad Line.

BEARSE MANUFACTURING CO.
3815-3825 Cortland Street, Chicago, Illinois

Australian Points to Sales Opportunities In His Own Line

CHICAGO—There are opportunities in Australia for selling American goods which have been largely overlooked by United States business men, declared J. M. Spencer, merchandise manager of Meyer Emporium, Ltd., of Melbourne and Adelaide, Australia, in a recent interview here.

At the time the interview was given, Mr. Spencer was taking a seven-months tour of United States, Canada, England, and continental Europe to study business conditions and merchandising.

Saying that Australia's prosperity depended fundamentally upon sales of raw products, and that increased trade between United States and Australia would mutually profit both countries, Mr. Spencer pointed out three circumstances that should give American exporters advantages in selling the Australian market.

1. Because Australian seasons are the reverse of those in United States—spring, for example, beginning in August and summer continuing until some time in January—American factories alternately could produce seasonal goods for both Australian and American markets.

2. American goods can reach Australia a whole month ahead of British goods sent at the same time. Shipments from the United States take only about three weeks in transport, while those from England take about seven.

The time saving, said Mr. Spencer, would be a special advantage in regard to that sort of merchandise in which style and freshness are important considerations.

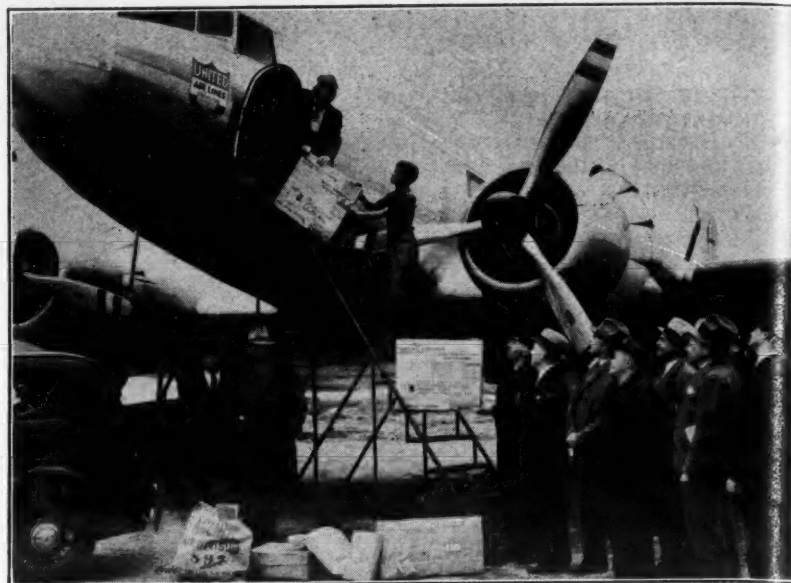
3. Recent developments in aviation and the latest plans for "clipper service," Mr. Spencer said, soon will make it possible for the Australian buyer to get to Chicago in five days, buy his full line, and be home again within two weeks.

Transvaal F-M Outlet Gets Apartment Job

JOHANNESBURG, South Africa—Wholesale Radio & Electric Co., Ltd., Fairbanks-Morse distributor for the Transvaal, has been awarded the contract to supply all refrigerators for Irol Mansions, a complete block of apartment buildings here, according to R. Suttner, managing director of the distributorship.

A large sign announcing the Fairbanks-Morse installations has been erected on the site of the new buildings. F-M refrigerator sales in South Africa for 1936 showed an increase of 400% over the previous year.

Refrigerator Promotion to China - - in 6 Days



Officials of Borg-Warner International see a package of Norge literature stowed away on the first leg of its journey to Hongkong.

Japanese Ocean Liner to Be Air Conditioned

TOKYO, Japan—Imperial Government Railways of Japan, reputedly the leading transportation agency in the Japanese empire, has installed a 140-ton Carrier system to completely air condition its liner Koan Maru.

A Carrier centrifugal refrigeration machine supplies cold water for the conditioning apparatus. The 8,000-ton vessel is claimed to be the first completely air-conditioned ship.

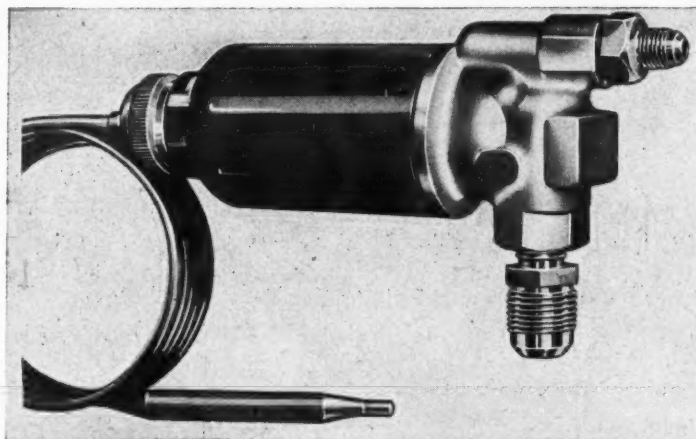
China Clipper Carries Norge Promotion to Orient

CHICAGO—Air-express shipments from Norge and Borg-Warner International Divisions of Borg-Warner Corp. were a part of the China Clipper's "pay load" recently on its first complete flight between Alameda, Calif., and Hongkong, inaugurating trans-Pacific passenger and air express service.

The Clipper carried Norge advertising material for its Hongkong distributor, Gilman & Co. The journey took six days.

STANDARD REFRIGERATING APPLIANCES

Another... OUTSTANDING VALUE COMBINING MANY NEW and ADVANCED FEATURES



TYPE "B"

THERMOSTATIC VALVES

These rugged, dependable valves assure a brand of performance which sets a new high mark for products of this nature. They are constructed of the finest materials available to the industry. A forged body, tough, non-porous and finely machined is only a part of the many new features embodied in these valves. Others include easily removable needles and seats, removable power elements (which have always been gas-charged) easily changed in the field. Adjustable and accurate to a fine degree. .093 orifice standard but .078, .125 and .156 available on order. 1/2" S.A.E. outlet standard with 3/8" or 5/8" available on request. 1/4" S.A.E. inlet.

Write for bulletins on the complete line of Blue Ribbon appliances

AMERICAN INJECTOR COMPANY
RILEY ENGINEERING CORP. Associate
1481-14TH ST. • Phone: LAFAYETTE 0350-0552 • DETROIT, MICH.

Be sure your refrigerator keeps that sales floor complexion.

Porcelain enamel is a mineral substance made glass-hard and fused right onto its supporting metal by 1550° heat.

No other finish could stand such heat, attain such hardness, nor endure so long.



PORCELAIN ENAMEL INSTITUTE, INC.
612 North Michigan Avenue
Chicago

To the business man

AIR CONDITIONING *Means* COMFORT COOLING



TO OWNERS and managers of office buildings "air conditioning" means cooling. It means the comfort of tenants during hot summer months. It means not only satisfied tenants but it also means a powerful attraction for additional occupancy. Many, indeed, are the situations where "air conditioning" has increased rental revenue and proved a profitable investment. Tenants gladly pay for summer cooling.

Building management has always heated offices in winter. Light, heat, and water have long been accepted as commonplace necessities. When summer cooling came into the picture, however, a powerful new feature was introduced. And more than a few office building managers have regretfully experienced the loss of tenants moving into neighboring "air-conditioned" buildings which offered comfort cooling in hot weather. Every summer sees more offices "air conditioned."

To owners and managers of office buildings "air conditioning" means cooling. To the business man in his office, also, "air conditioning" means summer cooling. It means relief from "heat waves"—it means assurance of comfort and health and efficiency while sidewalks broil in summer sun. It means greater efficiency on the part of office workers, of all employees. For they, too, work in summer comfort.

All in all, to those interested in profits, "air conditioning" means cooling and dehumidifying in summer time. This, to them, is the chief function of "air conditioning." The public acceptance of "air conditioning" revolves around the cooling and dehumidifying function. The cooling

feature which supplies the drama of "air conditioning" was developed and presented to the public, of course, by the refrigeration industry.

It is but natural that the public, in seeking "air-conditioning" equipment, should look first to the distributors and dealers who have successfully established mechanical refrigeration as one of the nation's leading industries. This potent group of business men forms the most logical sales outlet for "air-conditioning" equipment by reason of past experience in dealing with cooling and dehumidifying problems.

Air Conditioning is a rapidly moving, constantly changing industry. The weekly issues of the NEWS are carefully read by the most active factors in the industry. Many readers of the NEWS have already become important outlets for air-conditioning equipment. Many others are excellent "prospects" for the right kind of franchise. To manufacturers of air-conditioning equipment seeking sales outlets, the NEWS offers an exceptional opportunity for establishing contact.

**AIR CONDITIONING AND
REFRIGERATION NEWS**
5229 CASS AVE., DETROIT, MICHIGAN

Representatives: John B. Gallagher Co., Incorporated, 11 West 42nd Street, New York, New York Lewis & Noelle, 612 North Michigan, Chicago, Illinois

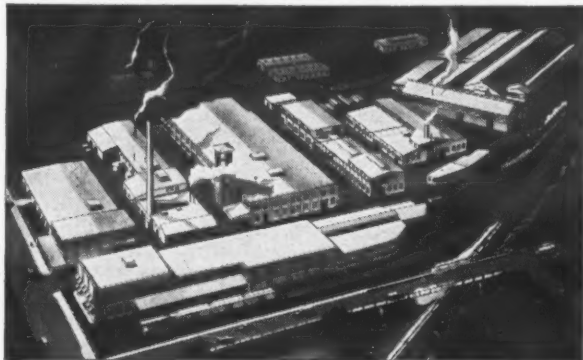
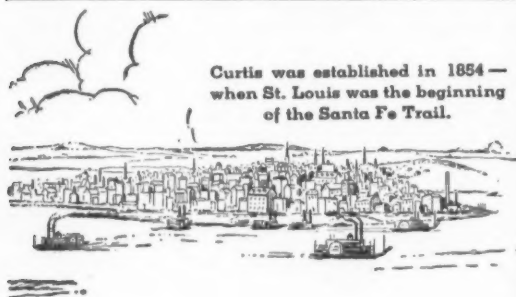
Proving Electric Refrigeration's Merits by Public Test



In this public test room, located in the lobby of Potomac Electric Power Co., Washington, D. C., 12 nationally known makes of electric refrigerators were tested over a 30-day period under conditions exactly like those during the city's hottest week in 1936. Panel at the extreme left could be opened to compare the purr of the refrigerators to the tick of an alarm clock. Combined current consumption meter and time dial are at right.



Red flood lights inside the test room gave visible impression as to the scorching temperatures being maintained during the demonstration period. Daily kilowatt-hour meter (above window) shows consumption per 24 hours, thermocouples (left) indicate inside cabinet temperatures of units on test, and recording thermometer (right) charts varying temperatures during the day, both inside and outside the test room.



20 ACRES of Modern Facilities...

● Curtis condensing units are produced in a comprehensive 20-acre plant, equipped with every modern engineering and production facility. They are the development of 83 years of designing and manufacturing experience, by an organization which established its name for reliability when Ulysses S. Grant was a wood-hauler on the streets of old St. Louis. That was 1854 — and from that beginning Curtis has reached the high and substantial place it now holds in the industry.

Eighty-six units comprise the Curtis line of today. Sizes range from 1/8 HP to 30 HP, with air-cooled and water-

cooled models. Unit coolers and coils to match are always in stock.

Curtis units are built to meet definite requirements — not price levels. Quality is the first consideration — price comes after. That is why so many dealers and installation engineers insist on Curtis units for all jobs. Curtis reputation safeguards their own.



Ulysses S. Grant probably hauled wood past the first Curtis establishment.

CURTIS REFRIGERATING MACHINE COMPANY

Division of Curtis Manufacturing Co.

1912 KIENLEN AVENUE

ST. LOUIS, MO.

Represented in Canada by
Canadian Curtis Refrigeration Co., Ltd.
20 George St., Hamilton, Ontario

CURTIS

Washington's Hottest Week, Full Food Load Simulated in Public Test on 12 Units

(Concluded from Page 1, Column 3)
by the U.S. Weather Bureau's records for the city during the week of July 9 to 15, 1936, Washington's hottest week of the year. One out of three days last summer reached a temperature of 90° F.

To simulate these conditions inside the test room, portable electric heaters, controlled according to daily temperature variations during the "hot week," were used. A recording thermometer made a permanent and continuous record of temperature variations in the test room, while thermocouples installed in each refrigerator gave a constant picture of temperatures inside the cabinets.

All the refrigerators were connected through a kilowatt-hour meter, which was set at zero reading at the beginning of the test. Current consumption records on individual units were not made. A 30-day electric clock, inserted in the circuit, recorded the number of days which the test had run.

To give the public a more ready appreciation of the daily kilowatt-hour consumption record of the six refrigerators, a separate meter was connected in the line, and set at zero daily.

By opening a special window in the insulated room, interested visitors could also ascertain how quietly 1937 model electric refrigerators operated, contrasting the slight hum of the six refrigerators with the tick of a spring-wound alarm clock. A sign over the window read:

"Through this opening you can hear every sound from inside this room. Compare for yourself the tick of the clock with the purr of the six electric refrigerators."

To make the test approximate actual operating conditions as nearly as possible, a 40-watt light bulb was burned for three hours daily inside each refrigerator.

Advance tests indicated that the heat given off by a 40-watt bulb in three hours is approximately the same as the heat units withdrawn from foods when a 6-cu. ft. refrigerator is loaded with food sufficient for the week-end requirements of a family of five.

Each morning, two trays in each

refrigerator were filled with 68° F. water, adding to the heat load. It was found by observation that Washington families, through the year, average two trays of ice cubes daily.

At no time during the test period did the thermocouples indicate the temperatures inside the refrigerator food compartments exceeded 50° F., even during the period in which the 40-watt light bulbs were burning.

To prevent salesmen from contrasting the operation of their particular refrigerator with that of competitors on test at the same time, the thermocouples were masked so as not to indicate the refrigerator to which they were connected.

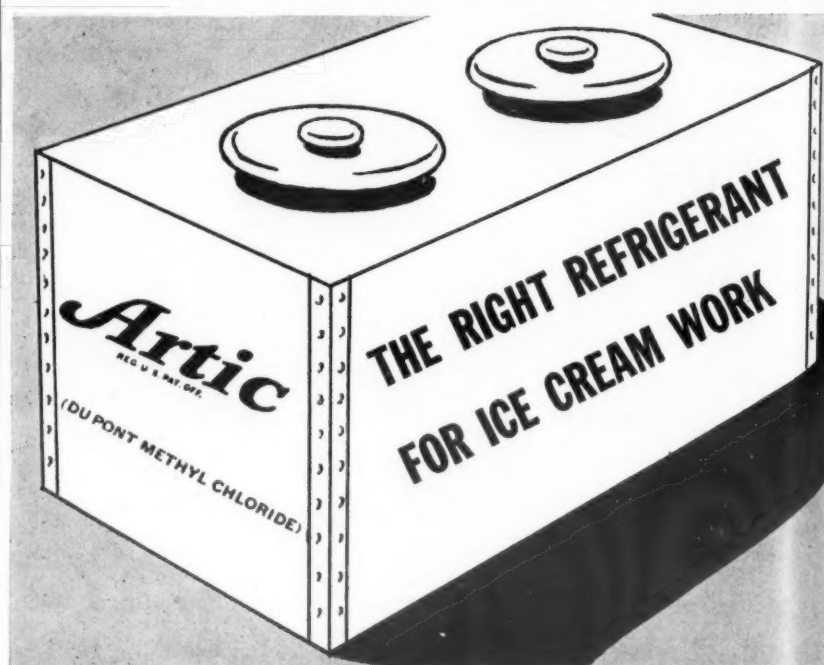
The public test was carried on only after the Institute had spent several weeks in making preliminary investigations and tests of the various manufacturers' products. In a specially devised test room, the Institute checked each refrigerator individually for operating time, kilowatt-hour consumption, ice-freezing ability, temperature maintenance, etc.

"Performance of all refrigerators tested was so favorable that the Institute had no hesitancy in presenting a combined test to a critical public," Institute officials state.

"Consensus of dealers, distributors, and manufacturers confirmed the Institute's contention that this type of demonstration proved the superiority of electric refrigeration in a far more convincing manner than the claims of individual manufacturers, which vary widely, and are often conducive to confusion in the public mind as to the desirability of electricity over other forms of refrigeration."

Electric bills of the Potomac Power Co. during the campaign carried a two-color broadside, acquainting its domestic customers with this unusual demonstration, and urging the public to "prove to itself that electric refrigerators provide Safety Zone Protection, regardless of scorching summer heat."

Refrigerators tested in the public demonstration were: Apex, Coldspot, Crosley, Frigidaire, General Electric, Hotpoint, Kelvinator, Leonard, Norge, Stewart-Warner, Universal, and Westinghouse.



IT'S a quick-cooling refrigerant, permits rapid production of "smooth" ice cream. It gives controlled low temperatures, easily and efficiently, so that ice cream can be held at proper cold before dispensing. That's why it's so widely used in ice cream and dairy cabinets. Recharge these units with the dependable Methyl Chloride—ARTIC—specified and used by leading manufacturers for over 16 years.

Stocked in principal cities in standard containers for prompt de-

livery. Send for "ARTIC Service News"—valuable servicing information, list of distribution points, etc.



E. I. DU PONT DE NEMOURS & COMPANY, INC.
The R. & H. Chemicals Dept., Wilmington, Del.

District Sales Offices: Baltimore, Boston, Charlotte, Chicago, Cleveland, Kansas City, Newark, New York, Philadelphia, Pittsburgh, San Francisco

ARTIC—The preferred Methyl Chloride for service work

COMMERCIAL NEWS

Duke Power Co.'s Milk Cooler Owners Report Savings

CHARLOTTE, N. C.—Dairy operators in the territory of Duke Power Co. have found installation of modern electrical dairy equipment both beneficial and economical, according to reports received from them by the utility.

P. A. Irwin, who late in 1935 purchased a 24-case Esco dairy cooler equipped with a 1-hp. Kelvinator condensing unit, and a 36-case Esco electric sterilizer, reports a monthly saving of more than \$45 since installation of the electric equipment, in spite of the fact that his milk production has doubled.

"At the time of purchase," states Mr. Irwin, "I was producing around 70 gallons of milk per day. At present I am producing 140 gallons."

"My refrigeration was costing me about \$30 per month. My fuel for sterilizing was costing me around \$15 per month. Gasoline for pumping water and generating electricity for lights averaged about \$22.50 per month."

"Now with my increased production I have found my monthly electric bill for the entire year of 1936 has averaged only \$21.95. This cost represents lights for my home, barn, and outbuildings, pumping water, refrigeration of the milk, and sterilizing bottles and utensils."

A. L. Little, who installed a Model B-8 Esco dairy cooler in June, 1934, declares that it "has proven to be the greatest money-saving, convenient, and satisfactory piece of equipment I have ever purchased for my dairy. During the two years I have had to pay for this cooler, it saved enough to pay for itself."

W. R. Lutz feels much the same way about the Model B-24-s Esco dairy cooler, with Kelvinator condensing unit, that he purchased some three years ago.

"I have always kept a strict account of my electric bills," he says, "and I feel sure that since the installation of the electric equipment I have already saved enough to pay it."

Betz Adds Copper Cooling Coil to 'Filterpure' Unit

HAMMOND, Ind.—Betz Corp. of this city, manufacturing the "Filterpure" unit for air-purification and air-circulation purposes in commercial refrigerators, is now introducing a new unit which combines the control of temperature and humidity with the above-named functions.

The original Filterpure units operated by circulating the air through a bed of activated carbon, which served to deodorize and purify it.

In the new unit, a copper cooling coil has been added. It is claimed that the unit, in addition to keeping low temperatures, maintains high relative humidities, because the coil is constantly wet, due to enclosed construction of the unit.

Air is brought into the Filterpure unit by means of flues or small ducts, and is discharged on both sides of the unit at the bottom, the airflow being outward and upward.

It is claimed that the unit will maintain satisfactory temperature in an 8-ft. double-duty display case when connected to a 1/4-hp. compressor, with the cut-in pressure (with methyl chloride) at 28 lbs. back pressure, and the cut-out point at 14 lbs.

The blower is of cast aluminum alloy, with an aluminum blower wheel driven by a capacitor motor. Casing for the unit is of stainless steel.

"Listen Boss —

Here's How You Can Get TRAINED Men"



U.E.I. Free Placement Bureau will put you in touch with a trained, competent worker. U.E.I. trained men have made good as shop mechanics, installation and service men in this industry for 10 years. This service is Free to you and prospective employee. Try it.

UTILITIES ENGINEERING INSTITUTE
404 N. Wells St. Chicago, Illinois
Established 1927

17 West 60th St. New York, N. Y.

Meier Electric Co. Sets 50% Greater Sales Quota for 1937

INDIANAPOLIS — Having made 175 Kelvinator air conditioning, commercial refrigeration, and beverage cooling installations during its year of organization, Meier Electric & Machinery Co., 3525 E. Washington St., has set a quota of 50% more business during the coming year.

Walter Rothschild, mechanical engineer, S. O. Stevens, sales manager, and salesmen Floyd Petty, R. G. Crooker, L. V. Burkhead, Kenneth Bryant, and Arthur Monroe comprise the staff of the firm, which is distributor of Kelvinator commercial refrigeration equipment in 35 Indiana counties.

G-E Distributor Opens Commercial Division

SCHENECTADY—To give dealers more efficient assistance in the sale of commercial refrigeration, A. Wayne Merriam, Inc., General Electric distributor, on May 1 established its engineered commercial refrigeration sales department as a separate operation, with H. J. Foster, former district sales manager, as engineering specialist.

Working under B. W. Stryker, general commercial refrigeration manager, Mr. Foster will assist dealers in promoting sales of engineered commercial equipment. "Package" commercial equipment will continue to be handled through district sales managers.

Lipman Opens Showroom Branch in Chicago

CHICAGO—General Refrigeration Sales Co., Beloit, Wis., has opened a branch office and showroom here with complete sales, service, and installation facilities for Lipman refrigerating machines and General Refrigeration air-conditioning equipment.

Bornstein to Handle Servel In Bethlehem Region

BETHLEHEM, Pa.—William Bornstein, Inc., has been appointed distributor of Servel electric refrigeration and air-conditioning products in this territory.

Howe Gets Birmingham Hospital Contract with \$7,850 Bid

BIRMINGHAM, Ala.—Howe Ice Machine Co. has been awarded the contract for installing new refrigeration equipment in Hillman hospital by the Jefferson County Commission. The Howe firm, low bidder, took the contract for \$7,850.

Because of expected fuel and labor savings, the new equipment should pay for itself in 12 months, believes R. E. Smith, acting chairman of the commission. Fred Walker, hospital expert, recommended the change after he completed a survey of the hospital recently.

Georgia Power Commercial Sales Jump in March

ATLANTA—With a dollar volume of \$73,888, March sales of commercial appliances made by the Georgia Power Co. were nearly double the total commercial sales volume for the two previous months, \$37,860.

Sales of commercial refrigerators and water coolers, which amounted to \$42,772, accounted for the largest per cent in the March total.

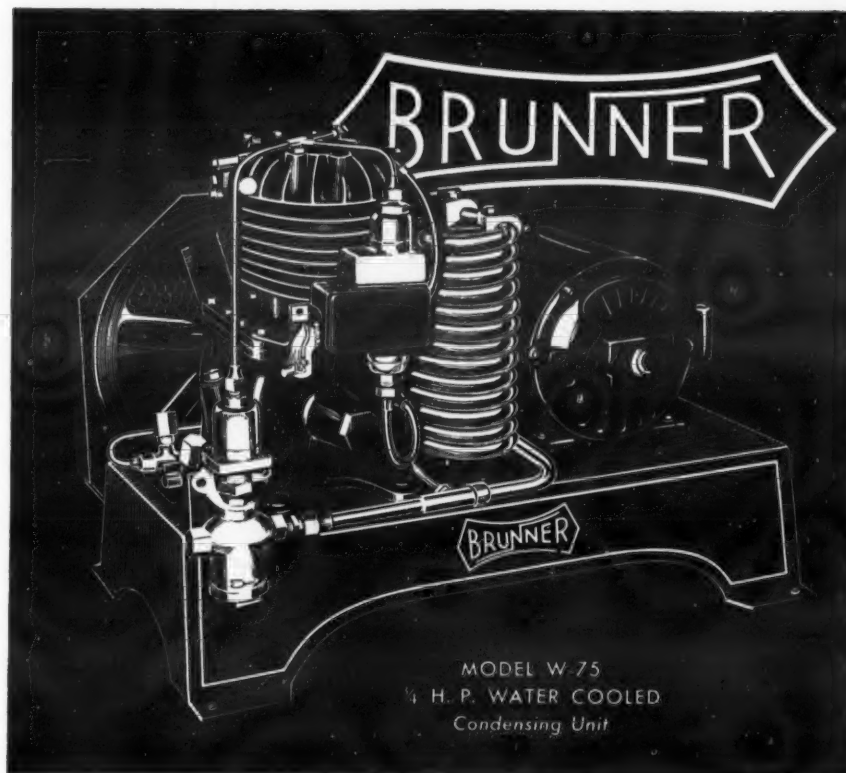
Cooking and heating equipment sales for the month totaled \$7,568, and water-heater sales, \$3,244.

Fishing Schooner Turned Into "Floating Refrigerator"

LOS ANGELES — Southern California's tuna fishing fleet plans to turn the four-masted schooner William B. Harriman into a floating refrigerator in which the catch may be stored while the fleet is on the fishing grounds. This will eliminate the necessity of each boat making frequent trips to port.

A second vessel is to maintain contact with the Harriman, bringing supplies for the fleet and returning to port with the catch.

SUCTION AND DISCHARGE VALVES ARE ASSEMBLED IN A COMPLETE VALVE PLATE UNIT FOR SIMPLIFIED REPLACEMENT



It rarely happens on a Brunner... but when the valves do "act up", the trouble can be corrected inside of a few minutes time. Yes, and you don't have to search for an expert—any mechanic can do it! The complete assembly of Brunner suction and discharge valves in a single valve plate means that by removing a few bolts, lifting out the faulty valve plate and installing a new one, the job is quickly finished without loss of service, without loss of refrigerant... The unique valve plate assembly exemplifies the advanced thinking behind every Brunner detail. Why not get better acquainted with the way Brunner Refrigerating Equipment is engineered for dependable service? * * Forty-seven condensing units and five compressor models for nearly all refrigerating and air conditioning requirements. BRUNNER MANUFACTURING COMPANY, UTICA, N. Y., U. S. A.

BRUNNER

BUILDS FOR

Greater DEPENDABILITY

MODERN...
to the last detail!

—these improved refrigerator doors

So many engineering improvements have been featured in the new ACE "Loxit" Hard Rubber Assembly units—doors, rails, jambs—that our large production facilities have been taxed to keep pace with the demand of manufacturers of display refrigeration cabinets.

Among these advantages—reduction of air leakage—lighter weight with greater strength—shock absorbing jambs—quiet roller bearing action—all with no increase in cost.

Complete range of doors sizes for every cabinet type. Storage and service doors, glazing strips, trim, etc.

Manufacturers: write for complete details and prices to

AMERICAN HARD RUBBER CO.
11 Mercer St., New York, N.Y.—Akron, O.
111 West Washington St., Chicago, Ill.

ACE "LOXIT"
PATENTED
DOORS

Around the World With George F. Taubeneck

Articles in Editor George F. Taubeneck's "Around the World" series have appeared in the following issues of the NEWS:

Jan. 8, 1936—Detroit, Mich.; Jan. 15—Jackson, Mich., and Chicago, Ill.; Jan. 22—St. Louis, Mo.; Jan. 29—Claremore and Tulsa, Okla.

Feb. 5—Dallas, Tex.; Feb. 12—El Paso, Tex., and Juarez, Mexico; Feb. 19—Yuma, Globe, and Phoenix, Ariz.; Feb. 26—San Diego, Calif. (also California Pacific Exposition).

March 4—Los Angeles and Hollywood, Calif.; March 11 and 18—San Francisco, Calif.; March 25, April 1 and 8—Honolulu, Hawaii.

April 15—Pago Pago, Samoa, and Suva, Fiji Islands; April 22 and 29—Auckland, New Zealand.

May 6—Melbourne, Australia; May 13 and 20—Sydney, Australia; May 27—Brisbane and Townsville, Australia.

June 3—Shipboard (Sydney to Singapore), and Darwin, North Australia; June 10—Papua and New Guinea, and Soerabaya, Java; June 17—Bandong, Batavia, Semarang, Soerabaya, Solo, and Djocja, Java; June 24 and July 1—Singapore, Straits Settlements.

July 8—Penang, Straits Settlements, and Rangoon, Burma; July 15—Calcutta, India; July 22 and 29—Benares, Agra, Delhi, and Bombay, India.

Aug. 5—Suez Canal; Aden, Arabia; and Cairo, Egypt; Aug. 19 and 26—Tel-Aviv, Haifa, Jerusalem, and Jaffa, Palestine.

Sept. 9—Complete text of paper delivered at Seventh International Congress of Refrigeration, The Hague, Holland; Sept. 16 and 23—Colon and Barcelona, Spain, and Marseilles, France; Sept. 30—Malta.

Oct. 7, 14, 21, 28, and Nov. 4—Paris, France (including study of French quota system and survey of the French market).

Nov. 11, 18, and 25—Monte Carlo and Italy; Dec. 2—Rome; Dec. 9—Milan and Venice, Italy.

Dec. 16, 23, 30, Jan. 6, 13, and 20—Vienna, Austria, Lichtenstein, Budapest, and Hungary.

Jan. 27, Feb. 3, 10, 17, 24, and March 3—Switzerland and The Netherlands.

March 10, 17, 24, 31, and April 7, 14, 21, 28, May 5 and 12—Denmark, Sweden, Germany, and England.

English Sales Training

(Continued from Last Issue)

Salesmen hired by MikiJohns receive their initial sales training at schools conducted by the International Refrigerator Co.

Additional help which the distributor receives from the sales promotion department of International Refrigerator Co. includes promotional literature, assistance in putting on shows and exhibitions in local communities, aid in effecting tie-ins with local theaters, and special advertising programs.

Leading sales arguments used in selling electric refrigeration to British housewives, as listed by this distributing firm, include: advantages of quantity purchasing, economy, varied menus made possible through owning an electric refrigerator, five-year guarantee, and extended payment plans (minimum terms on a five-year purchasing contract are 13 shillings, or about \$3.25, per week).

Direct-mail, phone calls, "using the user," and contacting outside business associates, are the four methods energetically used by MikiJohns to reach new prospects.

Maintaining exhibits of commercial equipment in the cattle markets, which have weekly trade days in Derby and Nottingham, is another promotional method used by MikiJohns.

"We find that a noticeable trait in

a commercial buyer's character is that he is most apt to place an order for equipment when he is away from his actual place of business," comments Mr. Burrows, "We believe also that in selling commercial equipment, satisfied users are by far the best new-business promoters."

Enlisting allied tradesmen as sub-dealers in small towns in the two counties covered in its territory is another sales boosting procedure employed by this distributing firm.

In this class of buyers ("allied tradesmen") are electrical supply dealers, ironmongers, chain stores, etc. A special direct-mail campaign used for contacting such merchants has as its initial mail piece a six-page folder, first page of which pictures a street crossing with the message "A Safe Proposition For You," sketched in between two caution lights, similar to the safety traffic crossing recently instituted by the British government traffic commissioners.

Description of MikiJohns' domestic and commercial line is contained in the folder's five other pages.

Expressing great interest in air conditioning and the applications to which it can be put in England, L. W. Burrows, director of MikiJohns, reports that the firm's most interesting commercial installation in this field is in a Derby shop, where equipment is installed to cool a window measuring 18x4x9 ft. The only insulation



Some of the London carriage trade are here shown leaving a reception at Buckingham Palace—one of the last given by ex-King Edward, now the Duke of Windsor. It was raining—as usual.

employed is a cork base (four inches deep) under the marble display slab in the window.

Insulated air ducts carry cooled air to the window display, and to a separate all-glass counter display cabinet. Thermostatic controls keep the temperature in the window within a 40 to 45° F. range, when temperature outside is 88° F.

To dispose of used refrigerators taken as trade-ins and reconditioned in MikiJohns' service department, the firm has entered the second hand sales market.

Makes of refrigeration equipment which the firm has taken in on trade-in deals include British Hallmark, British Automatic, Kelvinator, Servel, and Wagner commercial equipment.

MikiJohns is interested in obtaining literature and price quotations on American manufactured condensing units, evaporators, expansion valves, and temperature and pressure control gear, Mr. Burrows states.

Coldspot

Sears, Ltd., is British agent for Sears, Roebuck & Co., importing Coldspot refrigerators, and Kenmore vacuum cleaners and electric washing machines, obtained from America, through Sears International, Inc., Chicago.

These three imported Sears-Roebuck articles are sold by Sears, Ltd. on either a cash or time payment basis.

Consistent big space advertising is one of Sears Ltd.'s established policies, advertising being placed extensively in national newspapers and the better class women's publications.

Directors of the company are: E. J. Pollock; Neville Laski, K.C.; J. Caiden; J. M. Wallace.

Sears Ltd. operates only through exclusive area distributors and sub-

distributors, a policy which tends to eliminate overlapping and price cutting, according to Mr. Pollock.

Consumer promotion describes Coldspot refrigerators as possessing "the seven wonders of refrigeration," namely: protection of family health, waste elimination, reduction of household expenses, simplification of housework, "pepping-up" of parties, variation of menus, and revision of old-fashioned home management ideas.

This promotion material also lists "five benefits of cold" as a food-preservative, emphasizing the fact that "Food is not frozen in a refrigerator—it is merely safely kept until wanted."

Coldspot refrigerators can be bought for only sixpence (12 cents) per day, can be obtained on terms extending up to four years, and are guaranteed for four years.

Sparton

Sparton Refrigerator Co., exclusive distributor of Sparton refrigerators and radios in Great Britain and Ireland, has handled these lines for the last four years, according to M. Sobel of this company.

Selling refrigeration in England, says Mr. Sobel, has been an extremely difficult proposition until the last few years. The company started with another line of American refrigerators several years ago, and found practically no demand for the product.

In 1932 H. O. McClumpha, Sparks-Withington's export manager, persuaded the company to take on the Sparton line. Although only a few machines were sold that year, the market developed rather rapidly, and sales progress was surprising to Mr. Sobel and his associates.

Sparton Refrigerator Co. sold nearly 5,000 domestic refrigerators in 1936, Mr. Sobel reports. The company now maintains modern showrooms in one of London's prominent business centers.

The Sparton company also handles Brunner commercial units, which are housed in British cabinets for practically every commercial application.

These products are distributed through electrical wholesalers, dealers, contractors, and department stores. The company is equipped to install or service either domestic or commercial refrigeration in any part of England.

England still presents a difficult refrigeration market, Mr. Sobel declares, unless a manufacturer or distributor is prepared to give four or five years free maintenance on his products, for independent refrigeration servicing is not yet well developed here. Dealers simply will not take on a line that does not offer them fullest security in this respect, he says.

Commercial refrigeration in England, he continues, although much better known and of longer standing than the domestic variety, has not yet neared its saturation point. Here again, he warns, it is imperative that immediate service be offered to users everywhere.

The present market for air-conditioning equipment in England is poor, Mr. Sobel says, but he entertains little doubt that it soon will begin rapid development. His company intends to enter this field sometime this year.

Promotion pieces distributed by Sparton Refrigerator Co. describe the Sparton unit as "a luxurious necessity" and "a luxury that saves more than half its cost."

A folder gives complete specifications and prices of the Sparton line, and contains photographs of the various models. Accompanying copy emphasizes the waste-elimination and health-protection aspects of Sparton units.

Prices listed range from 22 guineas (approximately \$110) for the small 2½-cu. ft. model to 78 guineas (approximately \$400) for the 9-cu. ft. (Continued on Page 12, Column 1)

Their Eyes on Hollywood, London Youngsters Lead Lively Lives



One of the great worries of English parents today is the effect American movies are having on the speech, manners, and desires of their offspring. (1) Schoolgirls, having just left a cinema near Piccadilly, are still enthralled by Robert Taylor. (2) She's "An Old Cow Hand." (3) This handsome youngster, riding a pony at Brighton-on-the-Sea, looks something like Freddie Bartholomew.

SPECIALTY SELLING PLANS

Distributor Quota Contest Based on Consumer Survey

DETROIT—Capitalizing on a recent nationwide survey of consumer preferences, Kelvinator household refrigerator distributors throughout the country are now engaged in a nine-week "Showdown Parade" competition to determine the distributors who are able to surpass their quotas by the largest percentage.

Following the survey, which was conducted by the Wehrly Co. of New York City, the Kelvinator department of organization and development engineered a follow-up fact-finding program carried out by wholesalers and distributors throughout the country who checked each town in their territory for data on sales trends, sales possibilities, and other merchandising information.

Distributors have been grouped into regional divisions with the following Kelvinator executives acting as sponsors for the groups: western region, Sam Mitchell, director of advertising; southeastern region, Campbell Wood, director for public utilities; eastern region, Emery W. Lothrop, director of organization and development; central region, Harlow Lyons, director of distribution; and the south central region, sponsored by Godfrey Strelinger, assistant to the vice president in charge of sales.

Trophies will be awarded individual and regional team winners at the completion of the drive which has been arranged by Marvin S. Bandoll, sales manager of the domestic refrigerator division of Kelvinator Division, Nash-Kelvinator Corp.

Water Heater Council to Make Utility Award

NEW YORK CITY—Operating utility companies making the greatest contribution to the development of domestic electric water heating loads through planned promotion and selling during 1937 are offered the opportunity of winning a silver trophy and \$1,000 in cash by the terms of the National Electric Water Heating Council Award.

Announcement of the award is contained in a plan book titled: "Building Revenue With Electric Water Heaters," now being distributed to utilities throughout the country. The activity is the first step in a cooperative national promotion by manufacturers to secure broader public acceptance of electric water heating.

The plan book suggests that utility companies engage in a water heater sales campaign for at least two months this year, and gives details of plans which may be used successfully in outlining and conducting such campaigns. Major consideration, it says, will be given for the plan which is most original and which is most effectively executed. Intentions to enter must be signified by June 1.

Kinsey M. Robinson, president of the Idaho Power Co. is chairman of the National Electric Water Heating Council, which is sponsored by the Edison Electric Institute and the National Electric Manufacturers Association.

Parker to Open Selling School in Kansas City

KANSAS CITY, Mo.—The "College of Selling," a salesmanship school, will be opened here Sept. 6, with Paul P. Parker as dean and founder, it has been announced. Mr. Parker is owner of Parker's electrical appliance store.

Courses in direct selling, management, commercial selling, commercial law, public speaking, and sales-executive work will be offered. The appliance store will serve as a laboratory in which the student can gain actual experience.

Any student taking work in the "College of Selling," according to report, will become a life member of the school, and will have the continuous privilege of consultation on his subsequent business problems.

A number of students have already enrolled in advance, according to the announcement.

Homemaker's Program Pushes Norge Products

DETROIT—Continuous theme of "All Star Varieties," Norge's twice-weekly transcribed radio program broadcast over a nationwide hookup of 71 stations, centers around "Mary Moderne," hostess of the Norge Kitchen Committee, who answers home-making questions and gives hints on more effective use of appliances.

Among radio, screen, and stage stars appearing on this morning program are Frank Crummit, Julia Sanderson, Sam (Schlepperman) Hearn, Connie Boswell, Mildred Bailey, Tim and Irene, "Ukulele Ike" Edwards, and the Mills brothers. Radio bands of Ray Noble, Bunny Berigan, Louis Armstrong, Kay Kyser, Freddy Martin, Emory Deutsch, and Red Norvo are also featured.

Commercial announcements feature all Norge products, but place special emphasis on Low Temp refrigeration.

Deluxe Equipment Forestalls Excessive Trade-in Demands

DETROIT—Excessive trade-in allowance demands on old electric washing machines have been met by Kelvinator's laundry equipment division with the offer of a deluxe rinse-tub set to prospective purchasers.

Considered strictly as a sales promotion item, the rinse-tub set is handled on a non-profit basis.

According to V. J. McIntyre, sales manager of Kelvinator's laundry equipment division, the rinse-tub offer is expected to go far toward cutting down the necessity for excessive trade-in allowances.

Sound Slide Film Tells Hotpoint Range Story

CHICAGO—A two-part sound slide film has been prepared by the Hotpoint electric range division of Edison General Electric Appliance Co. to tell the story of the advantages of electric cookery.

First part of the film, titled "A Wise Wife's Wiles," deals with electric cookery's advantages; the second part, "Showroom Showdown," shows how they are incorporated in the Hotpoint range.

The film is for use in both sales training and consumer selling activities of dealers and utility companies.

Getting 'Life' into a Window Display



"Living display" in the window of Buffalo Electrical Market, Grunow dealer in Buffalo. The girl works from a series of cards on an easel telling the features, the last card inviting the audience to come into the store for a close-up inspection. Kurtzco Grunow Distributors of Buffalo arranged the display.

Frigidaire Launches Big Advertising Campaign

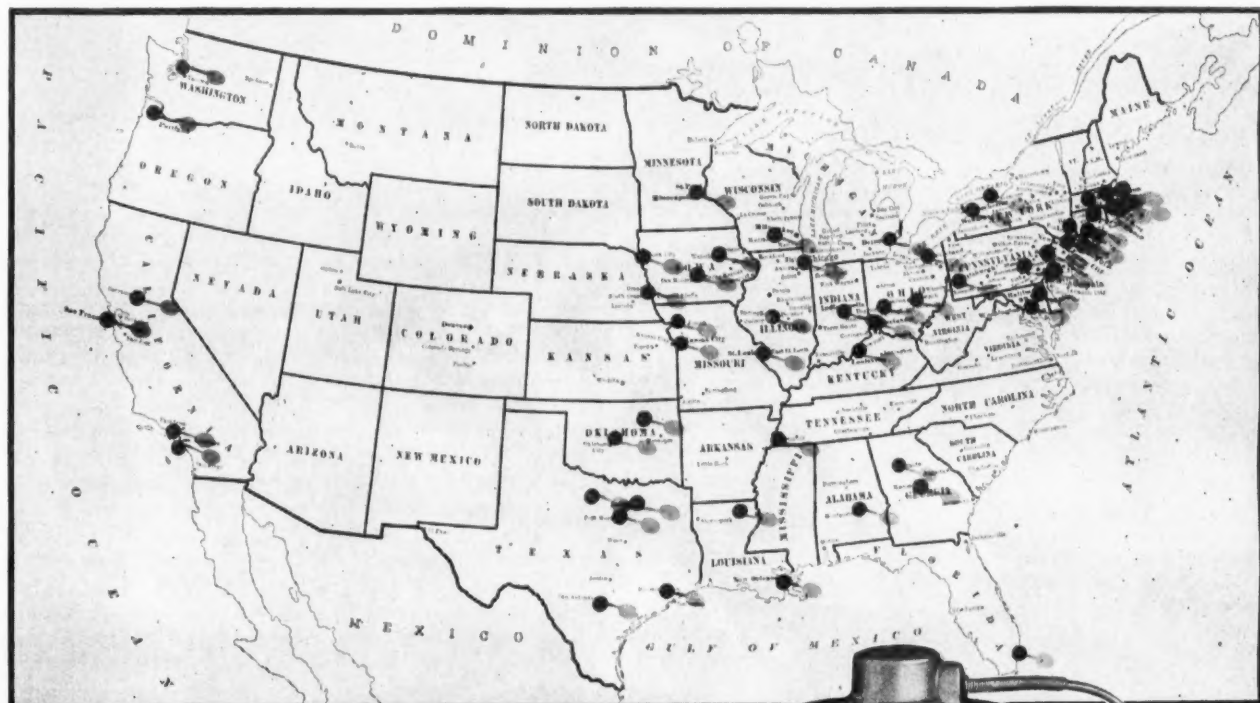
DAYTON—To back up activities of its national sales organization, Frigidaire Division of General Motors Sales Corp. this month is instigating one of the most aggressive advertising campaigns it has ever conducted,

says Lee A. Clark, household advertising and promotion manager.


The May campaign calls for insertions in 66 magazines, 191 newspapers in 142 key cities, and cooperative advertising placed direct by dealers, Mr. Clark said. Outdoor billboards also are being used.


The magazine list includes among


others: Saturday Evening Post, Collier's, Time, American Magazine, Cosmopolitan, True Story, National Geographic, Good Housekeeping, American Weekly, This Week, Woman's Home Companion, McCall's, American Home, Better Homes and Gardens, Household, Holland's, Liberty, Electricity on the Farm, Life.




Refrigeration Parts Jobbers Everywhere Stock Controls

Today, from coast to coast, refrigeration parts jobbers are supplying  control valves for refrigeration and air conditioning.

We are proud that our water solenoids, expansion valves, and humidity regulators, carried by these jobbers, require so little service, that more and more of their customers are using  Controls exclusively.

For prompt service and controls "that can be installed and forgotten" seek the jobber in your locality who carries  Controls.

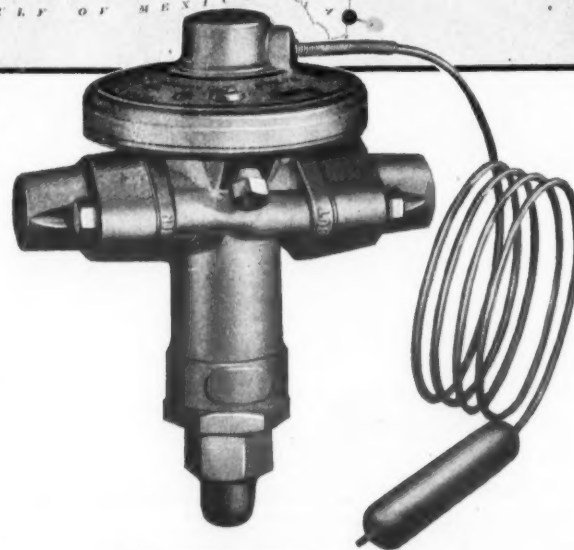
Shown above is the  Model 220-K Thermostatic Expansion Valve.

This valve has many outstanding features that account for its unusually dependable service.

Features


1. **MOISTURE PROOF**—Due to its construction moisture cannot enter into this valve to obstruct its operation, even though the valve is incased in a ball of ice.


2. **EASY TO CLEAN**—Simply remove the large hexagon nut at the base of the valve, and the parts will drop into your hand.



Thermostatic Expansion Valve No. 220K

3. **SENSITIVE**—The diaphragm of extra large area gives unusually sensitive operation.

4. **SEVERELY TESTED**—It was tested for three weeks at 110 degrees F. in order to put unusually severe pressure on the diaphragm. As a result no  Expansion Valve has ever been returned with a broken diaphragm.

5. **EASY TO INSTALL**— Expansion Valves operate perfectly even though installed in a temperature higher or lower than the bulb.

CORROSION-PROOF

Because the non-metallic, corrosion-proof poppet and seat (see detail sketch), in this new Sylphon Automatic Expansion Valve cannot corrode and pit, it always closes off positively, maintains constant pressure, for long periods and without attention.

Poppets are renewable, on the job. Filters are ample in size, readily removed. Moisture-proof . . . no rubber breather cap. All wearing parts renewable. For original equipment and for replacement service on Sulphur Dioxide, Freon or Methyl Chloride systems. Bulletin O-5000.

Sylphon
TRADE MARK



FULTON SYLPHON COMPANY, Refrigeration Division, Knoxville, Tennessee

AUTOMATIC EXPANSION VALVE



AUTOMATIC PRODUCTS COMPANY

2450 NORTH THIRTY — SECOND STREET
MILWAUKEE WISCONSIN

(Continued from Page 10, Column 5)
model. All eight models are offered on the instalment plan.

Sparton's three chief features, the anti-frost clock, the Vegabin, and the Baskador, are given particular stress.

Sparton does a good business in radios, both domestic and automobile. The English firm sells 10 models of the Sparton all-wave home radio line, ranging in size and price from the small, four-tube ("four-valve" in England) table model 427 X at nine guineas (approximately \$45), to the large deluxe console model 1867 A.G., with 18 tubes, five wave bands, gramophone attachment, automatic record changer, tone control, Viso-Glo tuning eye, and three speakers, priced at 89 guineas (almost \$450).

Only one model car radio is shown, priced at 15 guineas, or approximately \$75. Equipped with six metal tubes, it is advertised as, believe it or not, "The Quintessence of Perfect Reception."

Crosley, Starr Freeze

A. J. Bolcome, Ltd., London distributor of Crosley and Starr Freeze refrigerators, and Alba gramophones and radios, plans to extend its merchandising to include commercial refrigeration and air conditioning, according to E. K. Balcome, director.

As a first step towards developing this new business, the firm has secured the services of R. J. Nelson, formerly of the export department of the Crosley Radio Corp., Mr. Balcome reports.

Carrying the complete line of Crosley refrigerators and Koldrink bottle coolers, Balcome Ltd. also handles a line of larger domestic models manufactured by the Starr Freeze Co., of Richmond, Ind., which line it sells under its own trade mark, "Alba."

Reconditioned Units

A new type of foreign refrigeration sales outlet was introduced into the British market when Newbilt, Ltd., a firm which reconditions and sells used refrigerators, was incorporated in June, 1936. Its offices and plant are located at 3 Barrett St., London.

The firm buys used boxes chiefly from the United States, since the supply of trade-ins in England is extremely limited. The refrigerator cabinets are refinished, the units repaired, new motors installed, and the finished products are sold for approximately half the price of a new model. Each Newbilt product is covered by guarantee.

Officers of the firm are A. B. Balmerie and J. Prichard, directors; H. Jefferson, sales manager; and J. Henshaw, manager.

Parnall

One of the leading British manufacturers of commercial refrigeration cabinets, display cases, walk-in coolers, and insulated storage equipment of all types is Parnall & Sons, Ltd., whose headquarters are in London.

The firm is a subsidiary of W. & T. Avery, Ltd., manufacturer of weighing, counting, and testing machinery. In addition to manufacturing refrigeration cabinets, Parnall & Sons also manufactures office and store equipment, and dairy plant equipment for the Creamery Package Mfg. Co., Ltd., and affiliate English firm.

According to H. E. Smith, director, the refrigeration section of the business has developed so rapidly during recent years that it now is housed in a separate factory division. The firm's plants are located in Bristol, England.

Products manufactured by Parnall & Sons cover the whole range of insulated storage and display equipment for chilling, freezing, and sub-zero temperatures. The trade name under which they are sold is Crusader.

Mr. Smith claims that production of Crusader commercial refrigeration storage cabinets outstrips that of all other makes put together. The cabinets are used by all leading refrigeration machine companies, he states.

Products are sold directly to the cooling-equipment manufacturers, their agents, and dealers. The refrigeration division has a local manager and a staff at Bristol, and special departments in London and Birmingham.

P. H. Mills is managing director of the parent company (W. & T. Avery, Ltd.), while D. C. North is managing director of Parnall & Sons, Ltd.

Delco-Remy & Hyatt

Future prospects for refrigeration sales in Great Britain are particularly bright. There is a considerable market still undeveloped, believe officials of the Delco-Remy & Hyatt, Ltd., 111 Grosvenor Rd., London, S.W. 1, English agency for Delco electric motors.

This company estimates that more than 80% of the domestic refrigerators in use in Great Britain are powered by Delco motors, most of them imported from Canada to satisfy the demand for a British Empire product.

Riding in Style



E. G. Mittell, director of Electrical & Musical Industries, Ltd., lent the above Rolls-Royce and chauffeur to Editor Taubeneck.

Delco-Remy & Hyatt's interest in the refrigeration industry dates from 1930, when, to meet the demand for information and service on the increasing number of Delco motors in household and commercial refrigerating equipment, the firm built up a special Delco Motor Service Department in England.

Development of Service

Complete servicing data and repair equipment was obtained from the American factory in Dayton, which sent also a representative with full information and practical knowledge of the best methods to be employed in repair and service work.

Delco-Remy & Hyatt established the policy of completely rebuilding all motors sent in for repairs, and returning them to the customer with a printed 12-month guarantee attached.

Following the establishment of the service department, the company entered into a sales campaign which has resulted in an overwhelming preponderance of Delco motors in Great Britain's refrigeration field.

Steady progress is being made in the

commercial field, the company states, although there has been considerable difficulty in the interpretation of electricity regulations.

When the Delco High Torque motor for direct-on mains switching was first introduced, objections were raised that a violation of the regulation prohibiting squirrel-cage motors being switched direct on the mains had been committed.

Subsequently objections were satisfactorily answered and explained, but for a time the company was stymied.

Delco-Remy & Hyatt conducts its advertising on a moderate scale through trade journals, and maintains direct contact with manufacturers by means of its annual exhibition of electric refrigerators equipped with Delco motors.

Air Conditioning Coming

According to L. M. Mynard, sales manager of the concern, the increase in the number of British manufacturers and importers of electric refrigerators has led to healthy competition.

He states that the rate of develop-

ment in the air-conditioning field is increasing, and that there is likely to be considerable progress during 1937.

The general tendency of British air-conditioning manufacturers, Mr. Mynard says, is to follow American engineering practices. In many cases compressors and complete units are being imported from the United States.

Crompton Parkinson

Crompton Parkinson, Ltd., manufacturers of electric motors is generally recognized as the oldest electrical manufacturing firm in England, having been founded in 1878 by Col. R. E. Crompton, who was still hale and hearty at 92 years of age at the time of my visit.

Head office of the company is in Leeds, Yorkshire, and there are home branches in London, the Home Counties, Birmingham, Nottingham, Glasgow, Manchester, Bristol, Newcastle, Cardiff, Belfast, and Leeds.

Overseas branches and agents are located in Bangkok, Siam; Lisbon, Portugal; Teheran, Iraq; Shanghai, China; Singapore, Straits Settlements; Trinidad, British West Indies; Lima, Peru; Buenos Aires, Argentine; Mexico City, Mexico.

Montreal, Toronto, Winnipeg, and Calgary, Canada; Cairo, Egypt; Haifa, Palestine; Johannesburg, Union of South Africa; Colombo, Ceylon; Rangoon, Burma; Bombay, Calcutta, and Madras, India; Wellington, Auckland, Dunedin, and Christchurch, New Zealand, and Sydney, Melbourne, and Perth, Australia.

Future in Australia

The branches in Australia foresee a good future because of the recent Australian tariff penalties leveled against non-British motors. A factory has been established in Sydney.

Crompton Parkinson's motors are marketed under the trade name of "Minor," and are available in single-phase capacitor start-capacitor run, single-phase capacitor start-induction run, single-phase repulsion-start induction, single-phase split-phase, three-phase squirrel cage, and direct current types.

Outstanding feature of the motor is a new type "Marathon" sleeve bearing which enables the machine to operate for as long as two years without attention.

Horsepower ratings on the motors range from 1/20 to 1 1/2 B.h.p.

Personnel of Crompton Parkinson (Concluded on Page 13, Column 1)

England Is Building Today—But Tears Down None of Its Substantial Old Structures



In New York when a new building goes up, an old one is torn down first. Not so, London. There the massive old stands comfortably among the modernistic new. Samples of each: (1) The Queen Mary, queer combination of old and new ideas in ship structure. (2) Modern movie theater. (3) Piccadilly Circus—unchanged through the years. (4) Lamplighter. (5) Modernistic apartment.



(1) Old-fashioned inn and garden—charming and colorful. (2 and 3) Uniform housing development—reminds one of America. Note prices (\$3,425 and \$3,975). (4) Adjacent is an old church.

'Around the World' (England)

(Concluded from Page 12, Column 5)
includes Frank Parkinson, managing director, C. A. J. Martin, M.C.B.A., and G. S. Samways, head of the export department.

British Thermostat

The British Thermostat Co., Ltd., located at Sunbury-on-Thames, Middlesex, is the largest organization in Europe manufacturing thermostatic equipment for refrigeration, air-conditioning, heating, and industrial application. Most of its products are trade-marked "Teddington."

British Thermostat devices for the refrigeration industry include a complete range of thermostats for domestic and commercial equipment, pressurestats, expansion valves, float valves, bellows type shut-off valves, magnetic valves, dial thermometers, electrical temperature indicators and recorders.

For the air-conditioning field, the company supplies thermostats, humidistats, air-operated valves, dampers, hydraulically-operated valve and damper units, magnetic valves, and temperature-indicating and recording instruments.

Its line of heat control equipment, and of equipment for industrial purposes, is widely inclusive.

Directors of British Thermostat Co., Ltd., are M. Payne, W. A. Payne, J. E. Sherlock, and L. S. Swinnerton-Dyer. Harley Carter is publicity manager.

Armstrong Cork

Armstrong Cork Co., Ltd., Aldwych House, Aldwych, W.C.2, is one of England's leading manufacturers of insulation for the refrigeration industry.

It sells insulation to Frigidaire, Electrolux, and other major companies, including the biggest British commercial refrigeration manufacturer, Smithfield.

Managing director of Armstrong Cork Co. is Kenneth M. Kent, whom I first met at a party given by Mrs. J. B. Farish, wife of the recently-deceased managing director of York Shipley.

FTC Complaint Charges Unfair Competition by Ross Roy Service, Inc.

WASHINGTON, D. C.—Federal Trade Commission last Thursday, May 13, issued a complaint charging Kelvinator Corp. and Ross Roy Service, Inc., of Detroit, with unfair competition through cooperating to disparage the products of Kelvinator's competitors.

Ross Roy Service, Inc., is alleged to have published statistical data regarding mechanical refrigerators in "The Ross Roy Comparative Hand-Book," and in a series of bulletins, such publications allegedly have been issued in cooperation with Kelvinator Corp., which gave financial assistance although, according to the complaint, no connections between Kelvinator and Ross Roy were indicated.

These publications were distributed to approximately 5,000 dealers in and distributors of Kelvinator refrigerators, who are alleged to have paid Ross Roy Service, Inc., substantial amounts for them.

The respondents are charged with representing that the material in the statistical handbook and other literature was accurate, authoritative and unbiased, and that it was published entirely independent of all manufacturers, when, according to the complaint, these were not the facts.

The purpose of such representations allegedly was to mislead the trade and buyers into believing that the representations and comparisons were those of a disinterested organization having no connection with Kelvinator.

Concealment of this affiliation, according to the complaint, was calculated to prevent Kelvinator's competitors from fixing responsibility on it for such representations, and the methods devised and adopted by the respondents are alleged to have been calculated to deceive the trade and buyers as to the origin and weight of the attacks made upon competitive producers.

Air Control Leaders See Constant Price Level, Trained-Man Shortage

(Concluded from Page 1, Column 5)
He places the total consumer cost for all air conditioning purchased during 1936 at 70 millions.

Beginning with this figure as a starting point, and applying the progressive increase ratio mentioned above (doubling air-conditioning sales volume every two years) indicates a possible total air-conditioning sales by 1942 in excess of half billion dollars per year.

Mr. Carrier states that although the Carrier production schedule for 1937 calls for the production of 25,000 unit air conditioners, the medium size commercial market ranging in size from 10 to 40 tons of refrigerating effect still represents the most attractive field at present, both in dollar volume and in potential profits. J. J. Donovan, general manager of General Electric's air-conditioning department, feels pessimistic about the immediate possibilities of any great reduction in cost of air-conditioning equipment, because of its high ratio of material to labor costs.

If labor were the heavy item of cost, Mr. Donovan avers, the adoption of mass production methods could be expected to effect a considerable reduction in total costs, but he points out that efficient production methods can have but little effect upon the material costs, which represent most of the cost in the air-conditioning apparatus as fabricated in the factory.

However, since labor represents a much greater production of the cost of field installation and of fabrication of air-distribution systems, improved methods in the field can be expected to go much further in reducing the consumer costs of air conditioning. Such reduction in cost to the consumer would in turn result in a greater volume of business so that labor would benefit in the end along with everyone else.

This high cost of materials indicates the desirability of the adoption of less expensive materials to fabrication of the air conditioner. In this connection, Willis Carrier calls attention to expenditure by his company of 10 million dollars during 1936 for copper tubing and sheets for fabrication of heat transfer surface alone.

However, as Mr. Carrier points out, no overall economy results from substitution of available steels for copper in fabrication of heat exchange surfaces, because of the inferior heat transfer qualities of steel as compared with those of copper, because of steel's much greater susceptibility to corrosion, and because of the much greater difficulties in fabrication when steel is used instead of the more ductile copper.

Mr. Donovan reiterates former statements to the effect that the lack of trained men is the "bottleneck" of the industry, stating that the present serious shortage in men who know what air conditioning is all about is a serious obstacle to further growth of the industry.

In connection with the training of men for the air-conditioning industry, Works Manager Shipley, York Ice Machinery Corp., suggests a scheme whereby the courses of study available for the student may be kept abreast of the rapidly advancing science of air conditioning.

Mr. Shipley's thought is to pool the latest knowledge of the ACMA members and from this concentrated essence, to develop a continuously up-to-the-minute course of study for use in schools which might be accredited or even endowed by the association.

The York manufacturing chief feels that this method of keeping the air-conditioning student modernized might remedy the present situation in which the graduate often lacks even a speaking acquaintance with the latest methods of air-conditioning engineering.

J. M. Fernald, Baker Ice Machine's general manager, admits that his outfit keeps "pecking away at air conditioning." In fact he acknowledges the "pecking" to be so good for Baker that its production department is beginning to have words with the sales department.

However, Mr. Fernald does not feel that the Omaha concern stands alone in this respect, as he understands that everybody in the air-conditioning business is getting "snooty" to the extent of being pretty "choosy" about the air-conditioning jobs to accept.

W. W. Rhodes, Kinetic Chemicals' sales manager, is considered by the industry to be in a good position to know what the air-conditioning industry as a whole is doing, because he is selling to it the Freon which it uses in its cooling business at the rate of about 1,000,000 lbs. per month.

Mr. Rhodes predicts that air-conditioning sales for 1937 may exceed sales during last year by as much as 80%. He sees no likely reason why air-conditioning sales should not at least double in volume every two years for several years.

Commonly heard around Hot Springs was the opinion that, while the smaller air-conditioning concern with low overhead may get a living out of air conditioning by sales of units assembled from fans, motors, controls, and heat transfer surfaces purchased from manufacturers of such products, the large manufacturer with heavy fixed costs is forced to make just about everything used in his product in order to make his business pay respectable dividends to the stockholders.

A sentiment which seems to be common among both ACMA and RMA members is that the two associations should be combined into one, since the similarity between the refrigeration and the air-conditioning industries is so pronounced.

Members of ACMA are as follows: Baker Ice Machine Co., Inc.; Carrier Corp.; De La Vergne Engine Co.; Delco-Frigidaire conditioning division, General Motors Sales Corp.; General Electric Co., Kelvinator division, Nash-Kelvinator Corp.; Parks-Cramer Co.; B. F. Sturtevant Co.; The Vilter Mfg. Co.; Westinghouse Electric & Mfg. Co.; and York Ice Machinery Corp.



AEROFIN

Heat Exchange Surface
**PROVED
PERFORMANCE**

Aerofin Cleanable Tube Unit with Removable Header



Aerofin Direct Expansion Unit Centrifugal Header Type



Universal Aerofin



Aerofin Direct Expansion Unit



Aerofin Continuous Tube Water Coil



**AND A COMPLETE LINE
For Every Requirement**

AEROFIN light-weight fan system heating and cooling surface offers just about everything that architects, engineers and heating contractors have always wanted. For more than fifteen years Aerofin has been the standard by which heat exchange surface is judged. If it is Aerofin it is the ultimate in service, satisfaction and reliability. That is why it is the dependable choice of men engaged in air conditioning, heating or ventilating.

More Aerofin heat exchange surface is sold than any other type—more than 45,000,000 feet of it since Aerofin was first introduced. Forty-five million feet of experience is in the manufacture of Aerofin.


Investigate Aerofin—today. Send to our home office or to any of our branch offices for descriptive literature. Take advantage—without obligation—of the service our engineers can render. Their prompt effective technical cooperation on any problem is at your disposal.

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NEWARK, N. J.

Chicago Detroit New York Philadelphia Dallas Atlanta

AEROFIN
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Manufacturers
of Nationally
Advertised
Fan System
Apparatus.
List upon Request

Accurate CONTROL



Patent Nos.
1,974,631
1,987,948
2,011,379

Thermostatic and Automatic Expansion Valves, Constant Pressure Valves, Check Valves, Non-Frost Coils, Evaporators, Condensers, Unit Coolers, Ice Cube Makers, All-Season Air Conditioning Units and Coils, Unit Heaters, Automotive Radiators.

Are you getting your copy of the **FEDDERS NEWS?**

FEDDERS MANUFACTURING CO.
BUFFALO, ATLANTA, BOSTON, CHICAGO, CINCINNATI, DALLAS, LOS ANGELES, NEW YORK, PHILADELPHIA

Photo by Ewing Galloway

Accurate control is just one of many performance features that have won world wide approval of Fedders Model 33 Thermostatic Expansion Valves. The responsive, modulating action of their Vapor Charged Power Element, and their easy, sensitive adjustment, make single and multiple systems behave. Remember, you pay nothing extra for Fedders EXTRA Quality. Specify Fedders and you get the best.

THE AIR AGE

BY F. O. JORDAN

Air Conditioning By Government Decree

No little consternation is evidenced by the air-conditioning and refrigeration industries regarding the latest threat to their well-being in the form of the code prepared by the government in Washington for application in the District of Columbia.

Two reasons for this consternation were whispered about the lobby of the Homestead hotel down in Hot Springs, Virginia where the Refrigerating Machinery Association and the Air Conditioning Manufacturers Association last week held their 1937 conventions.

One of these is that although the code is for the District of Columbia only, there is danger that it will permeate through the states because of its use as a model by governmental powers from coast to coast. The other reason is a very simple one, being merely to the effect that it is feared that the general application of the code will just about wreck the air-conditioning and refrigeration industries, also from coast to coast.

It is claimed that this code whose mission is to regulate established and highly technical processes, was formulated by the Bureau of Standards, and some department whose duty is to inspect plumbing installations, and that all attempts to place upon the board men experienced in the industries which the code is to govern were scorned as being a menace to the public which benefits by these industries.

Although it is difficult to understand why an industry would destroy itself deliberately by concocting a code contrary to the best engineering practices so laboriously developed at great cost over a long period of years by its engineers, it was claimed down around Hot Springs that offers in Washington of technical assistance to the code-makers were shunned as if the presence of experienced air-conditioning and refrigeration engineers during the code-making might in some way jeopardize the weal of the "forgotten man."

One of the provisions of this plumbing-minded refrigeration code is said to limit refrigerants used in air-conditioning systems to a quantity much less than that required to condition the space served by the air-conditioning system.

It is said that the enforcement of this limitation alone would practically put a stop to air conditioning and deprive a sweating public of its benefits because it would force the use of the generally much more expensive "indirect" system.

In the face of the general present attempt on the part of the air-conditioning industry to bring the cost of air conditioning down within the financial reach of the forgotten man, such results would be crippling. It would mean the end of recent growing hopes that the air-conditioning industry was at the threshold of serving its turn as the next stepping stone to a higher standard of living, and to a new era of common prosperity.

Nor is the wave of consternation stirred up by this refrigeration code limited to the cooling industries themselves, for owners of hotels, restaurants, theaters, and other heavy users of air conditioning and refrigeration are perturbed also.

So serious is the situation thought to be that the very near future will witness a meeting in Washington, at which representatives of all industries concerned in this code will meet with governmental representatives in an attempt to avert what is feared will seriously injure air conditioning, the healthy but perturbed industrial baby, and to its yet growing brother, refrigeration.

Should this meeting prove to be successful in turning out a really effective code which does not defeat many of its own purposes, it will be unique in the annals of code-making, for the conventional municipal plumbing code seems to be the result of a chance meeting of plumbers who know what it is all about but cannot write, and lawyers who can write but do not know what it is all about.

Watch AIR CONDITIONING AND RE-

FRIGERATION NEWS for future developments, as we have been invited to have a representative present in Washington at the hearings.

Riding Up With Air Conditioning

The easiest way to go places, young man, generally is to catch yourself a ride on something that is going there.

In the broader sense, to go places in life the average fellow finds it necessary to land himself the most future-looking job in sight, keep his eyes open, and work like everything. Then by the time he is too old to have any fun anyway, maybe he can afford to retire. However, the chances for arriving even at that crossroad of life are slim if the job which the old man selected when he was young and full of pep happened to be in an industry already well developed when he started with it.

So we focus our attention upon air conditioning, the industrial babe who holds a position unique in all the annals of industry, for with its market practically unscratched, it is the object of a practically universal desire. Almost unanimous is the belief that air conditioning is upon the threshold of an unparalleled rise.

Another "believe-it-or-not" feature about air conditioning is that even in our generally highly competitive economic structure, there is but little competition for the many good jobs available in the air-conditioning industry, simply because there are more good jobs open than there are good men available.

Men like Shipley of York, Donovan of General Electric, Willis Carrier, and in fact anyone whom you may ask, all declare that the training of men for air conditioning is lagging far behind the pace set by the progress of the industry itself. Furthermore, another complaint which is universal among the industry's leaders is regarding the type of training, which they find (after hiring them) has been given to many of the graduates of various and sundry air-conditioning "schools."

Apparently it is not sufficient merely to "pay your money, and take your choice" when selecting the school which you hope will prepare you for one of those good air-conditioning jobs.

Many an air-conditioning executive will tell you that frequently he has hired bright young graduate air-conditioning engineers who glibly repeated either forward or backward, thermodynamic theorems recollected only vaguely by the successful practicing engineer, only to find that the graduate was unable even to start performing the routine chores of air conditioning. Thus these executives have the fixed opinion that there is no use depending upon the unaffiliated school for the much-needed supply of air-conditioning trained personnel.

Probably the reason for such opinions is that their holders have been unfortunate in the particular schools in which their unsatisfactory men were trained. For the expression "pigs is pigs" which is intended to convey the thoughts that pigs are all alike, cannot be used for describing air-conditioning study courses. Air-conditioning courses are more like eggs, as their general appearances may be similar, but when you get on the inside of some of them—"whoole." Yet other eggs and schools are okay.

To be useful to the air-conditioning industry, the study course must not indulge in vague theorizing, nor even teach the student to repeat thermodynamic theorems in conventional parrot-like manner.

A few days ago an ambitious young man at the threshold of graduation from an air-conditioning school asked the writer what would happen to the absolute temperature of so much "perfect gas" at a certain absolute pressure if the pressure were increased so many times.

Upon being asked what he wanted to know that one for he said that he undoubtedly would be asked such a question during the final examination which would foist him onto the

cold shoulder of the air-conditioning industry; and the young man repeated Charles' Law better than we have heard it done since we were being exposed to engineering at Old Purdue about 1917.

Upon being asked a few live questions about what happened to the latent-to-sensible ratio when ratio of prime to secondary cooling surface is doubled, and what does suction pressure do if airflow through the conditioner is reduced, he looked at us as if he thought we were the nitwit that we are.

See what we mean? And the nice young man will understand, too, about 10 years from this date, when and if he forgets all about that course he is paying for and finds out what it is all about.

The only way on earth that a school or a course of study can place bright young men in those good air-conditioning jobs which are fairly begging to be taken, is to teach them the practical fundamental relationships which determine performance of refrigerating and air-conditioning equipment so simply and thoroughly that they can think in terms of refrigeration and air conditioning.

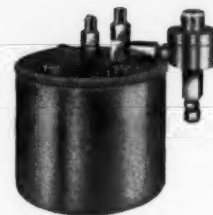
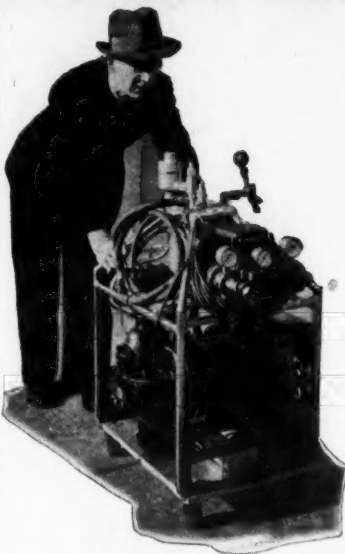
Probably it always will be advisable for each manufacturer, or other unit of the industry, to conduct its own finishing school for the purpose of teaching its beginners regarding the peculiarities of particular methods and equipment.

But it would be a tremendous help if the manufacturer could start with beginners who already were able to do their thinking in terms of his business, instead of being forced to work on beginners with nothing to offer except their emptiness of the open mind.

SELL TEMPRITE COOLERS

NOW!

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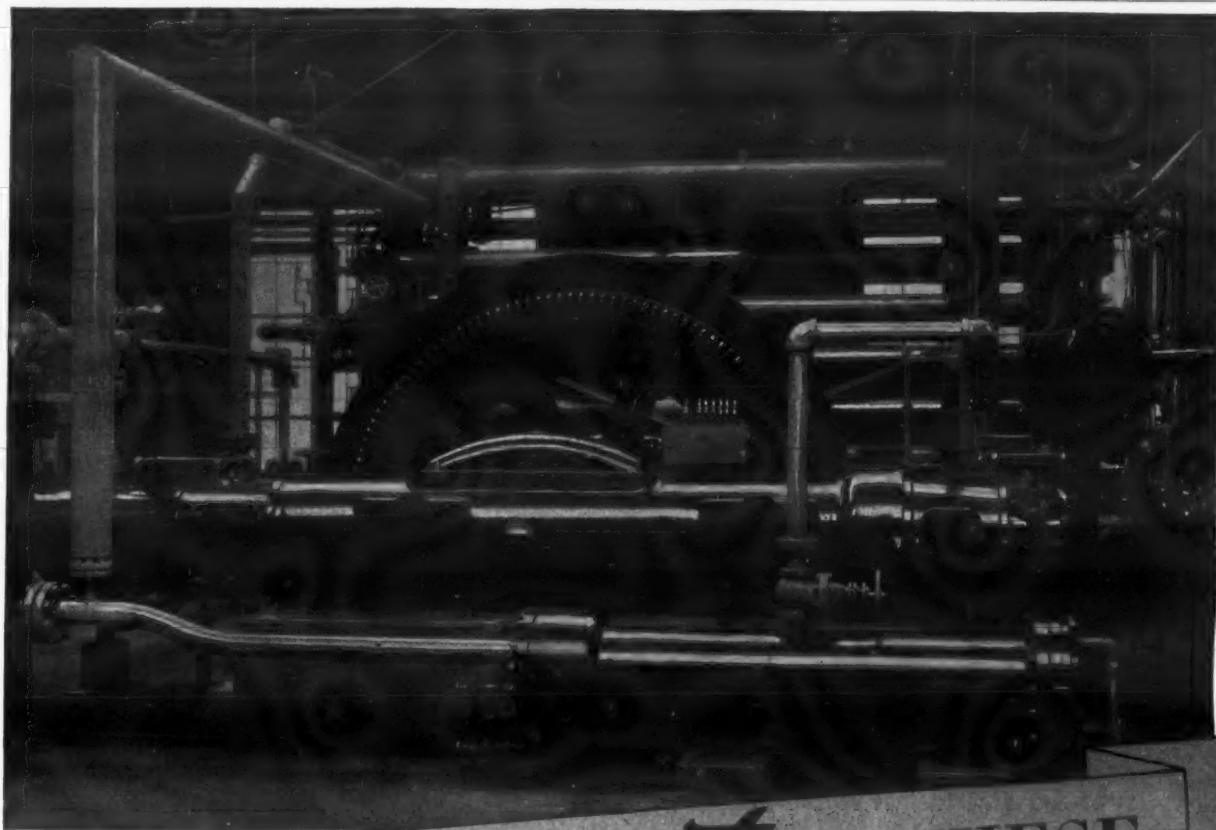


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ORIGINATORS OF INSTANTANEOUS LIQUID COOLING DEVICES



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IMMEDIATELY you put them to work, you'll see the difference. Valves, rings, cooling coils, and passages keep clean, and efficient . . . when you use the new Capella Oils.

Capella Oils are especially refined for refrigeration use. Wholly distilled, filtered, dehydrated they flow freely at sub-zero temperatures, and do not react with refrigerants. They have unusually high stability.

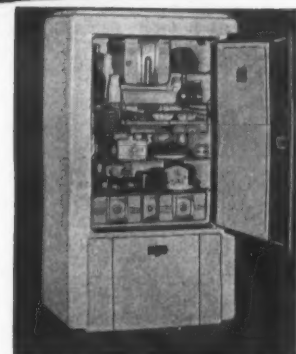
Many oils of lower stability break down and form tarry and gummy deposits that stick rings and valves,

congeal in coils, reduce efficiency, require frequent cleaning.

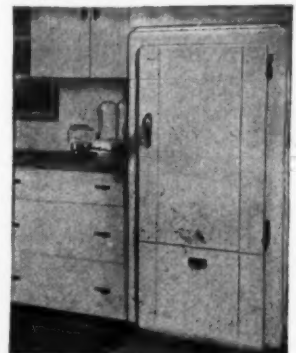
Six grades make Capella Oils the most complete line for every refrigeration need. Don't fail to try them.

Trained lubrication engineers are available for consultation on the selection and application of Texaco Petroleum Products.

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Westinghouse Home Refrigerator. All portable and household units operate efficiently when lubricated with Texaco Capella Oils.



TEXACO Industrial Lubricants

Method for Figuring Heat Load On Commercial Installations

The information published on this page, including Chart No. 1, is reprinted from the book, "Certified Refrigeration Standards and Engineering Data," published by the Chicago Master Steam Fitters' Association. The material is copyrighted and is reprinted here with the permission of the association.

The book, which contains a great amount of engineering and standards data for use by the refrigeration and air-conditioning engineer, is available to anyone who wishes it at a cost of \$2.50 a copy.

The material published on this page is from the section on "Commercial Refrigeration" and offers a simple way of making heat load calculations for a commercial job.

REFRIGERATION—COMMERCIAL

Condensing Unit should be rated as described on page 4 and at a suction pressure not higher than the pressure corresponding to the evaporating temperature for which the evaporator to be used is designed.

Evaporator should be of suitable design for the individual job and its refrigerant-containing parts should permit passage of refrigerant without exceeding two-pound pressure drop between inlet and outlet.

Pipe lines and connections should be not less in diameter than shown in Table 17.

Line Valves and Fittings should be located to permit efficient servicing or quick replacement of condensing units, evaporators, expansion valves, and other operating parts without exposing the interior of refrigerant-containing parts to air and moisture.

For heat load calculations and selection of equipment refer to the following explanation, chart, and tables of this section.

HOW TO USE COMMERCIAL REFRIGERATION CHART NO. 1

Chart No. 1 is based on 4 inches of cork board insulation or equivalent, 50° F. temperature difference and "Walk In" type of refrigerator. For small "Reach In" type refrigerator Add 33 1/3% to the chart reading.

For temperature difference other than 50 degrees multiply the chart Line B reading by the proper factor from Table 11. For insulation other than 4 inches multiply by the proper factor from table No. 10.

Commercial refrigeration heat loads consist of two items which are referred to on this sheet as "wall load" and "product load." The "wall load" is the heat that enters through the walls of the refrigerator. The "product load" is the heat that enters

the refrigerator with foods or commodities and opening of doors.

EXAMPLE: A market "Walk In" refrigerator. Location first floor.

Size 6' x 12' x 8' high. Insulation 3 inches thick.

Refrigerator temperature (t) 35° F. Exposed temperature (T) 90° F.

Refrigerator difference (T-t) 55° F. Exposed exterior surface 432 sq. ft.

Table No. 12 shows exposed temperature (T) to use.

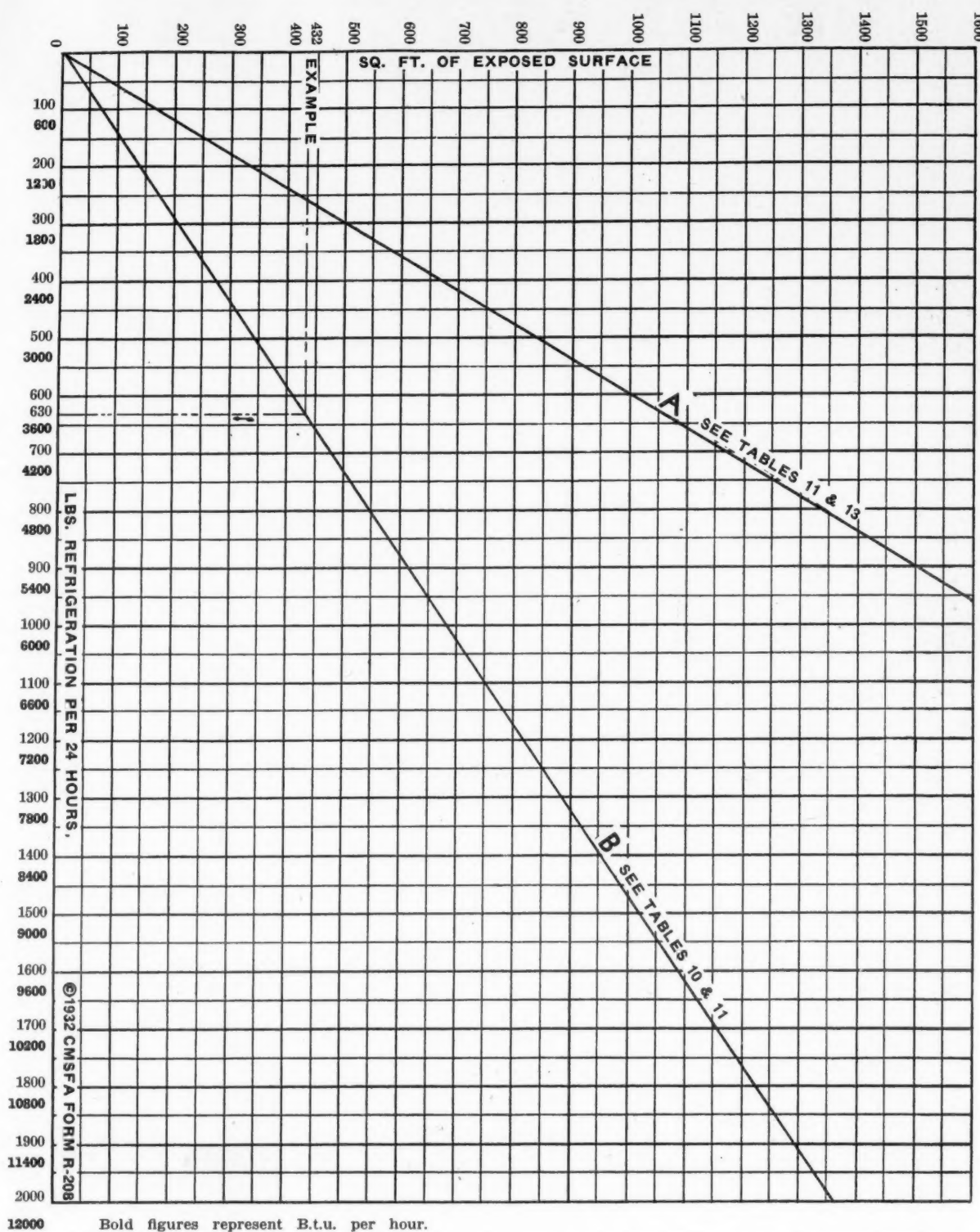
Chart No. 1, Line B shows that 432 sq. ft. of exposed surface requires 630 lbs. of refrigeration per 24 hours. From table No. 10 take multiplier 1.20 for 3 inches of insulation. From table No. 11 take multiplier 1.1 for temperature difference of 55° F. 630 lbs. x 1.20 x 1.1=832 lbs. of refrigeration per 24 hours. Select a compressor having capacity approximately 20% larger or approximately 1,000 lbs. The size of pipe lines is shown by Table No. 17.

NOTE: Commercial refrigeration for the handling of foods in wholesale and retail trade has sufficient uniformity to permit the practical use of certain factors or multipliers with the aid of charts, thereby simplifying the estimating of refrigeration loads. Insulation, inside temperature and outside exposure create different combinations of conditions, therefore the need of a multiplier for each condition as in tables 10, 11, and 13. Foods placed in the refrigerator are usually warmer than the refrigerator temperature but seldom exceed the outside exposed temperature. Also the maximum quantity of foods handled per day through the refrigerator is sufficiently uniform to permit the practical use of factors. See Line "B" on chart for total heat load and tables 10 and 11 for multipliers.

Another class of commercial refrigeration is bulk cooling at the place of preparation, distribution or manufacture such as eggs, poultry, sausage, meats, and numerous manufacturing processes. This class of refrigeration requires that the wall load be read separately and that the product load and air changes be estimated in accordance with the existing conditions on the premises of each installation. See Line "A" on chart for wall heat load and tables 11 and 13 for multipliers.

The chart No. 1 is marked to 1,600 sq. ft. but may be used for larger areas. For example, 2,400 sq. ft. is the same as 1,200 sq. ft. read from the chart and multiplied by two.

Chart 1—For Commercial Refrigeration



Bold figures represent B.t.u. per hour.

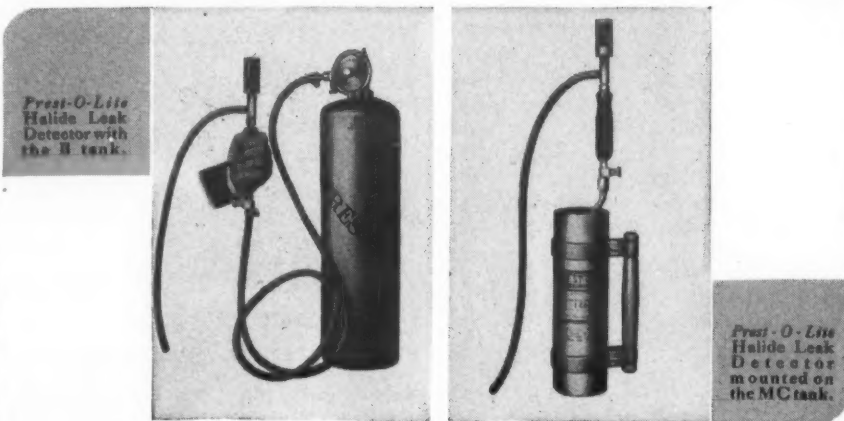
Table No. 24 (Part 1)
Drinking Water Requirements

Type of Service	Delivered Water Temp., F.	Gal. Per Person Per Hr.	Waste and Consumption Per Person Per Hr., Oz.	Consumption Only Per Person Per Hr., Oz.	People Served Per Gal.
Office (cup)	45-50	.033	4.2	4.2	30
Office (bubbler)	45-50	.083	10.5	4.2	12
Light mfg.	45-50	.143	18.3	7.32	7
Heavy mfg.	50-55	.20	25.6	10.24	5
Not heavy mfg.	55-60	.25	32.0	12.8	4

PREST-O-LITE

Trade-Mark

HALIDE LEAK DETECTOR



The Prest-O-Lite Halide Leak Detector is a positive, sensitive device for locating leaks of non-combustible halide gases in refrigerating and air-conditioning units. These gases—such as F-12 (Freon), F-21, F-114 and Carrene—are relatively odorless, tasteless and colorless, properties which render necessary a quick, sure method of locating leaks.

Ask your jobber or any Linde office for a demonstration and descriptive folder.

THE LINDE AIR PRODUCTS COMPANY
Unit of Union Carbide and Carbon Corporation

UCC

New York and Principal Cities
In Canada: Dominion Oxygen Company, Limited, Toronto

FEATURES

- 1 Assures instant reaction to any concentration of refrigerant gases.
- 2 No preheating, pumping or priming required.
- 3 Economical to use. Need not be lighted until actual testing begins.
- 4 Two-color flame variation gives visible indication of amount of gases.
- 5 Quick clearing of flame after exposure to leaks.
- 6 Reaches easily into inaccessible places.
- 7 Readily portable—ideal for service work.

Table No. 24 (Part 2)
Gallons Per Hour

Restaurant	...40-45	.1 gal. per person
Cafeteria	...40-45	.083 gal. per person
Theater (movie)	...45-50	1.0 gal. per 100 seats
Theater (legitimate)	45-50	1.0 gal. per 100 seats continuous. Each fountain shall have storage capacity to provide 5 gal. in 10 min.
Schools	...45-50	Same as office.
Hospitals		
A.—Per bed	45-50	.083 gal.
B.—Per attendant	45-50	.083 gal.
Hotels	...45-50	.08 gal. per room
Public fountains—(amusement parks, fairs, etc.)	45-50	20 to 35 gal.
Dept. stores, hotel and office building lobbies	45-50	4 to 5 gal. fountain

THE NEW ZENITH REFRIGERANT FILTER

... FOR SULPHUR DIOXIDE FREON OR METHYL CHLORIDE REFRIGERATORS



Engineered Refrigerant Filters in a variety of sizes for varying capacities.

FINER SPACINGS THAN ANY ASBESTOS SACK OR WIRE SCREEN

LOWER PRESSURE DROP!

BETTER PROTECTION!

Special features include: Patented Element—Easily and Quickly cleaned—Easy to Install—Insures Positive Protection from Dirt in the Refrigerant Liquid—Corrosion-proof, Leak-proof and Ample Capacity. Write for full details.

ZENITH CARBURETOR CO.

Subsidiary
BENDIX AVIATION CORP.
Detroit, Michigan

THE HILL REACH-IN REFRIGERATOR

Made Especially for HOT KITCHENS

Here is a box with heavier insulation, to keep down operating costs; all-porcelain exterior and interior, to withstand hard usage; better refrigeration, to prevent spoiling and drying; and many other features.

• Send for complete illustrated 32-page catalog using business letterhead.



Note thick center of low conductivity corkboard insulation and also insulating board covering entire exterior, including frame.

THE HILL
TRENTON, N.J.

HILL PRODUCTS DIVISION
C.V. HILL & CO., INC., TRENTON, N.J.

Additional Commercial Installation Data

Table No. 10

INSULATION MULTIPLIERS
For Line B on Chart

Single glass	multiply by 7.0
Double glass	multiply by 3.0
Triple glass	multiply by 2.0
Quadruple glass	multiply by 1.7
1 in. insulation	multiply by 1.75
2 in. insulation	multiply by 1.40
3 in. insulation	multiply by 1.20
4 in. insulation	multiply by 1.00
5 in. insulation	multiply by .90
6 in. insulation	multiply by .85

Table No. 11

TEMPERATURE DIFFERENCE
(T-t) MULTIPLIERS
For Lines A and B on Chart

Degrees	
100	multiply by 2.0
95	multiply by 1.9
90	multiply by 1.8
85	multiply by 1.7
80	multiply by 1.6
75	multiply by 1.5
70	multiply by 1.4
65	multiply by 1.3
60	multiply by 1.2
55	multiply by 1.1
50	multiply by 1.0
45	multiply by .9
40	multiply by .8
35	multiply by .7
30	multiply by .6
25	multiply by .5
20	multiply by .4
15	multiply by .3
10	multiply by .2
5	multiply by .1

Table No. 12

REFRIGERATOR EXPOSURE
TEMPERATURE

Basement below ground using no artificial heat	80°
Ground floor or above using no artificial heat	90°
Exposed to artificial heat as kitchens and similar locations	100°

Table No. 13

MULTIPLIERS

For Line A on Chart

1 in. insulation	multiply by 4.00
2 in. insulation	multiply by 2.00
3 in. insulation	multiply by 1.30
4 in. insulation	multiply by 1.00
5 in. insulation	multiply by .80
6 in. insulation	multiply by .67

DRINKING WATER REQUIREMENTS

Table 24 shows the average temperatures and quantities for determining the cooling load for various types of service. To the actual heat load from the calculated water quantity must be added the heat gain through the walls of water containing parts and the heat equivalent of the power required to drive the circulating pump if used.

COMMERCIAL NEWS

Norge Introduces New Water and Beverage Cooler Models

DETROIT—New lines of pressure and bottle type water coolers, and a new beverage cooler, all powered with the Rollator compressor unit, have just been announced by Norge division of Borg-Warner Corp.

Three pressure type water coolers are produced, with cabinets constructed of rust resisting furniture steel, finished in mist green or brown lacquer. Top and base are built of cast gray iron finished in mist green or brown vitreous enamel.

Chrome-plated brass bubblers are self cleaning, equipped with pressure regulating valve, Bakelite bubbler control, and stainless steel anti-splash drain grill.

Two tap models have chrome-plated brass glass filler with control and flow adjustments. Model PG-1357, the largest, has a basic cooling capacity of 13.5 gallons per hour, with a 2 gallon storage capacity. Model PG-627 has a basic cooling capacity of 6.2 gallons per hour, and storage capacity of 2 gallons. Model P-487 has a cooling capacity of 4.8 gallons per hour, with three-quarter gallon storage capacity.

Water temperature is controlled thermostatically, with control dial concealed under flush door on right side panel. Eleven temperature positions are available—one normal, five warmer and five colder.

The bottle type water coolers are designed for use where water supply and drain connections are not available, or where special water is desired. Basic construction finish, and temperature control are the same as pressure type coolers.

Equipment includes a 3-qt. waste receptacle constructed of cast gray iron finished in green or brown vitreous enamel, fitted with rubber bumpers, easily lifted off and replaced. Bottle gasket is made of black, non-odorous rubber. Two holes are pierced in right side panel to accommodate any standard cup dispenser.

The coolers have a basic cooling capacity of 4.7 gallons per hour, with a three-quarter gallon storage tank. Specifications on pressure and bottle type water coolers are given below.

Norge beverage coolers are of the immersion type. Cabinet design is modern, constructed of anti-rust treated furniture steel, built around and supported by all-steel welded

center and bottom frames of battleship construction.

Exterior finish is in vermillion red or sahara tan. Two gliding, lift-off lids finished in black enamel with chromium trim form the top of the cabinet. Chrome plated tubular steel is used for the base of the cooler.

Sanitary bottle decapper and easily removable cap receptacle is mounted on the outside of the cabinet. Under the cap receptacle is a concealed temperature control with 11 positions—one normal, five warmer, and five colder.

Interior tank is constructed of heavy gauge galvanized sheet steel, fitted with drain connection for rapid cleaning. Cooling coils are mounted between metal baffles around inside of side and end walls, and bottom of the tank, furnishing natural water circulation. Coils are of 1/2-inch copper tubing, electro tin plated. Sulphur dioxide is the refrigerant. Bottle racks are made of woven wire grids welded on heavy frames. The cooler will hold 150 to 175 six-ounce bottles, 130 12-ounce bottles, 62 24-ounce bottles, or 48 32-ounce bottles.

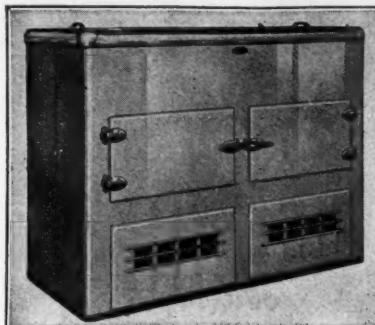
Name plates of nationally advertised drinks, made of galvanized steel with metal drive screws for installation on the beverage cooler, are available in the proper design.

Equipment includes a plug-in cord socket and 6-foot extension cord.

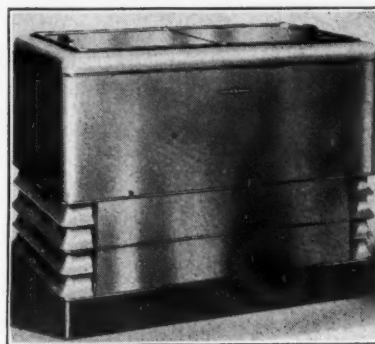
Brunswick Opens Display Rooms in Tulsa

TULSA, Okla.—A new office and display rooms have been opened by Brunswick-Balke-Collender Co., manufacturers of "Blue Flash" beverage coolers and refrigerators, at 317 E. Fourth St. Z. C. Shreve is in charge.

1937 Beverage Coolers



PELCO



GENERAL ELECTRIC



NORGE

Modern lines feature these 1937 beverage coolers.

Farmers Establish Cold Storage Locker System Despite Opposition

AMBOY, Ill.—Farmers of Lee county, through the medium of their own Farm Bureau, overrode opposition of the state's farm leaders in promoting and sponsoring the cooperative community locker plant here for cold storage of all perishable farm produce.

Following an inspection trip of similar locker projects in northwestern Iowa, the bureau set up a committee to promote the local plant. Construction work was begun last November, and the 220-locker, 10-ton plant, operated by a York 4 x 4-inch ammonia compressor was completed the following month. An additional 110 lockers were added in March of this year.

Four rooms in the plant are devoted to the processing of meat. As soon as it is brought into the plant, meat is placed in the chill room where a constant temperature of 32° F. is maintained. After remaining in the chill room from three to five days, the meat is cut into small pieces and wrapped in paper which will not stick to it, and which will not permit moisture to escape.

These small packages are labeled and placed in the quick freeze room, where temperatures of 4 to 6° below zero are maintained. After several days in this room, the meat is transferred to the lockers, which are kept at 16° F.

A trial locker fee of \$10 has been established for the first year, but the permanent fee will be \$12 per year. With this income, the Amboy Cooperative expects to meet operating expenses, lay aside money to cover depreciation, and retire in six years the \$11,400 balance of the sum required to build the plant. After these obligations are met, surplus income from the plant will be returned to patrons in the form of patronage dividends.

350 HORSE POWER SLIP RING MOTOR



GET Speed Changes in the MOTOR!

Where the fixed speed changes of Multispeed Squirrel Cage Induction Motors—such as 1800/1200, 1800/300, 900/450 RPM—with push button or drum control—are not sufficiently flexible for the application requirements, use Century Slip Ring Motors, in sizes up to 300 Horse Power.

These slip ring motors are adapted to 2 classes of service—Constant Speed, or Adjustable Varying Speeds... Also, to conditions where high starting torque and low starting current are desired—or where heavy inertia loads increase the time necessary to bring the load up to full speed—or where the nature of the load makes it desirable to increase the accelerating period.

To provide greater flexibility, more satisfactory service and more accurate production control in installations requiring speed changes, use Century Slip Ring or Multispeed Squirrel Cage Motors.

CENTURY ELECTRIC COMPANY

1806 Pine Street St. Louis, Mo.
Offices and Stock Points in Principal Cities



SIZES UP TO 600 HORSE POWER

Announcing AN IMPORTANT NEW REFRIGERANT CONTROL

GENERAL K20-A

Silent solenoid valve for positive shut-off of fractional tonnage installations.

THIS new General Controls magnetic refrigerant valve is now available in 1/4" and 5/64" port sizes, the latter size for fractional tonnage installations.



TIGHT SHUT-OFF

Packless in construction, closing with the pressure on top of the seat, the K20-A assures an absolutely tight shut-off indefinitely and automatically closes in case of current failure. Maximum operating pressure 200 pounds.

QUIET, ECONOMICAL OPERATION

All materials are corrosion proof to liquid and gas refrigerants. The solenoid is hum free, waterproofed, and consumes but 8 watts of current.

CAPACITIES	PREON	METHYL	SO ₂
1/4" Port Liquid Line	5.4 tons	12 tons	14 tons
5/64" Port Liquid Line	.65 tons	1.4 tons	1.6 tons

All ratings based on 2 lb. drop.

\$8.40
LIST PRICE

GENERAL CONTROLS

1505 Broadway, Cleveland, Ohio
267 5th Ave., New York City, N. Y.
1370 Harrison St., San Francisco, Calif.
421 Dwight Building, Kansas City, Mo.

How to Select and Install Air Conditioning Systems

By T. H. Mabley

Case No. 16

An Auditorium Or Theater

The comforts of air conditioning are probably never so well appreciated as in an auditorium or small theater where crowds of people may gather in a limited space for two or three hours and at all times of the year.

Such an air-conditioning application problem involves almost all the known fundamental functions of an air-conditioning system. Ventilation must be the first consideration; this means adequate and proper distribution and circulation of air which, of course, will include a means of introducing a large volume of fresh air and exhausting the same quantity of air from the conditioned area.

The building must be heated to the proper inside temperature during the winter season, while in the summer a maximum inside temperature must be maintained for proper comfort.

To a limited degree a comfortable relative humidity, at least during the summer period, should be maintained. In this particular case the control of minimum humidity in the winter will be optional.

DIFFERENCE IN OCCUPANCY

In connection with this latter item both the requirements and the load will vary over a wide range. When the building is almost fully occupied the actual relative as well as absolute humidity of the room even on a cold dry day will be considerably increased above the condition when the building is unoccupied.

Because of this action which some-

what offsets the lowering of the humidity by introduction of large volumes of fresh air, the item of humidification will be considered as not absolutely essential for the original installation, but as a refinement to be added later.

The function of air cleaning, while not absolutely essential, is very desirable and will definitely be considered as part of the installation. With filters in the system the volume of dirt and other foreign matter found in the outside air and brought into the space on the shoes and clothes of occupants will be partially removed before settling on furnishings and decorations in the space. Such dirt often shows up around the discharge openings of the air-distribution system and if, as in this case, the ceilings and walls are light colored, additional cleaning or re-decorating costs may be reduced by proper filters.

The auditorium shown in Fig. 1 is one end of a large building and the entrance faces east. This leaves the entire south and west sides exposed to the sun.

FIGURING SUN LOAD

Since the south side is the greatest area and is more directly adjacent to the conditioned space, we will consider the sun load on this side only in the heat gain calculations.

An additional sun load must be considered from sun shining directly on the flat roof. The ceiling of the auditorium is hung from the roof beams, but the temperature inside the space between the roof and the ceiling becomes exceedingly high when the sun shines on it in spite of the several natural draft ventilators provided to vent the space.

Next step is to select certain design conditions on which to base the load calculations. The factors of sun load which must be consid-

ered in the heat gain calculations have been mentioned, but for conduction and fresh air loads definite inside and outside design conditions must be determined.

DESIGN CONDITIONS

In this particular case 95° dry bulb and 75° wet bulb are the maximum and 0° dry bulb as the minimum for outdoor conditions.

With these conditions outside we will want to maintain, because of the high concentration of people in particular, 78° dry bulb and 50% relative humidity maximum, and 70° dry bulb minimum inside the conditioned area.

The building has a normal seating capacity of 600 people, but since this rarely occurs, we will take an 80% load factor and thus use 480 occupants for the heat gain calculations.

In selection of the quantity of fresh air the figure, in this type of installation, should be based on the number of expected occupants.

If we use a minimum value of 12½ c.f.m. per person under maximum outdoor conditions for the design number of occupants we will have a very minimum of 10 c.f.m. per person of fresh air when the building is fully occupied.

We will therefore size our equipment to handle a minimum of 6,000 c.f.m. of outdoor air under maximum conditions, but will naturally want to have additional intake capacity to introduce into the auditorium a much larger quantity when the outdoor air is comparatively mild and there is not the full heating or cooling load on the system.

HEAT LOAD

With these limiting conditions determined and with other available data we can now calculate our heating and cooling loads. A summary of the Load Calculations made by the usual methods is shown in Table 1. As might be expected, the ratio of sensible heat to total heat in the heat gain calculations appears to be rather low. This particular condition must be definitely kept in mind when selecting the cooling equipment.

With ratios as low as this it is usually necessary to operate the cooling medium at rather low temperatures and permit the air to pass through the cooling surface at low velocities. Such are usually the requirements when a high occupancy load is encountered.

The equipment necessary to give the necessary performance to meet the requirements will in this case consist of a built-up conditioning unit and a refrigeration compressor to supply cooling effect by means of direct expansion.

The refrigerant used must meet the requirements of the local codes for direct-expansion systems for auditoriums.

ALTERNATE SYSTEM

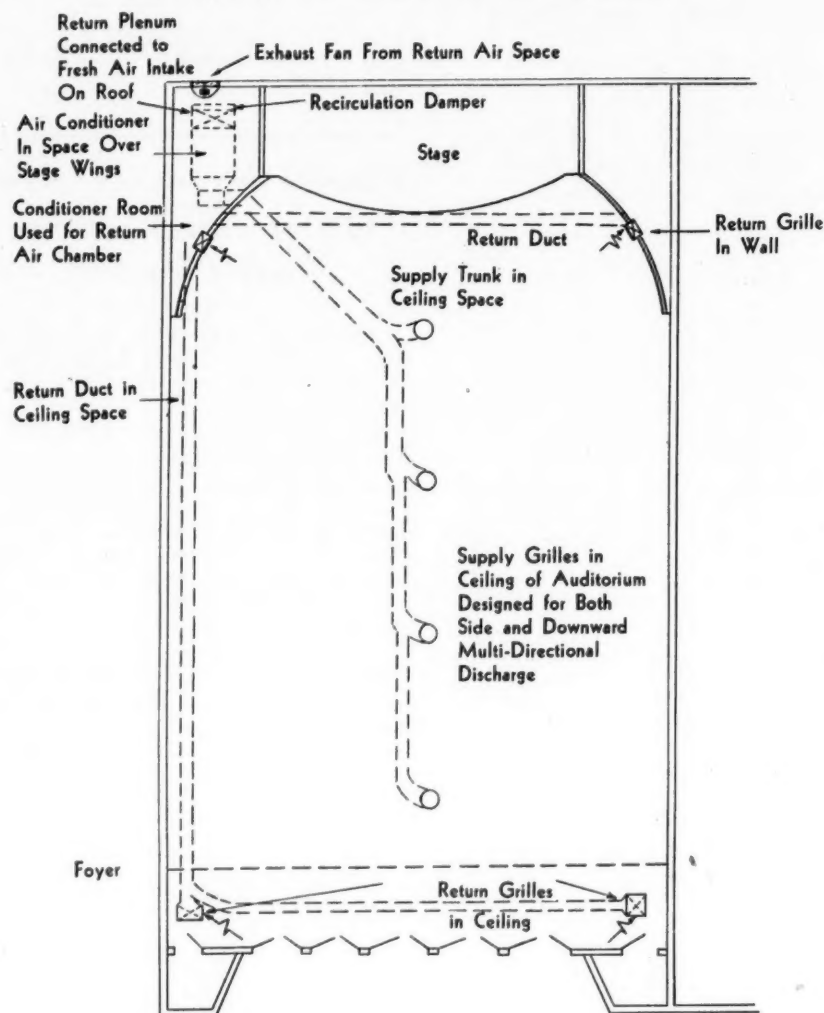
An alternate to this type of cooling system is the indirect system in which water is circulated through the coils in the conditioner. In this type of a system the water is cooled by means of a cooler located near the compressor in the basement. This method will be discussed in a future case.

The conditioning unit which will be assembled on the job will be comprised of blower, heating coils, cooling coils, a filter bank and blower motor with the proper belt drive. The volume of air to be handled may readily be approximated by checking the total internal sensible heat to be removed, and selecting a minimum discharge air temperature of approximately 63°.

Thus if we divide the total sensible heat by (78-63) degrees x 1.03 we find that the total volume of air to be handled will be about 15,000 c.f.m.

A blower, motor and belt drive should be selected to handle this volume of air against a static pressure of 1½ inches of water, which

Layout of Auditorium System



Summary of the Heat Load Calculations

Heat Loss	
Conduction—walls and roof	134,000 B.t.u.
Fresh Air—6,000 c.f.m. x 1.03 x 70°	432,600 B.t.u.
	566,600 B.t.u.
Safety Factor 10%	56,660 B.t.u.
Grand Total	623,260 B.t.u.
Heat Gain	
Sensible	
Building Load—(conduction)	28,000 B.t.u.
Building Load—(sun effect)	66,000 B.t.u.
Fresh Air—6,000 c.f.m. x 1.03 x 15°	92,700 B.t.u.
Occupancy—480 people x 220	105,600 B.t.u.
Lights—6,000 watts x 3.4	20,400 B.t.u.
Total	312,700 B.t.u.
Latent	
Occupancy—480 people x 180	86,400 B.t.u.
Fresh Air—(104-74) grains x .64 x 6,000 c.f.m.	115,200 B.t.u.
Total	201,600 B.t.u.
Total Heat Gain	514,300 B.t.u.
Duct Loss and Safety Factor 5%	25,715 B.t.u.
Grand Total	540,015 B.t.u.
Ratio—Sensible Heat/Total Heat	= .624

is the estimated value for this particular system.

BALANCING EQUIPMENT

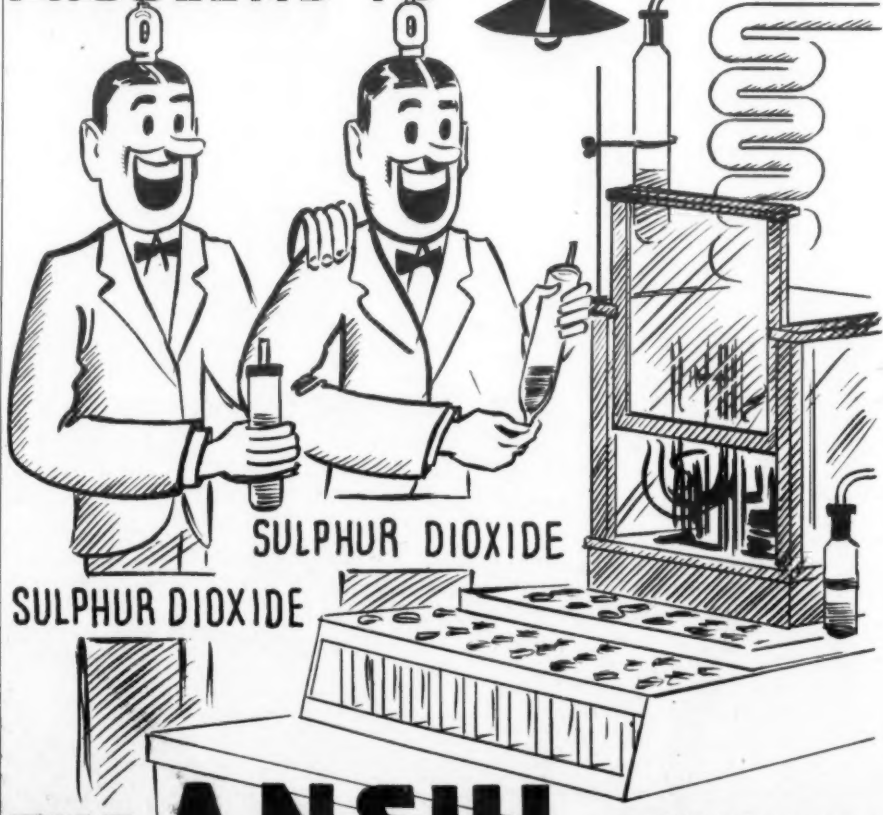
Selection of a cooling coil requires considerable juggling between the proper cooling coils for various refrigerant temperatures to give the necessary performance and the ca-

pacities of different refrigeration machines.

If a large machine is used the size of the cooling coil is reduced but refrigeration machinery costs more than cooling surface.

A compromise combination of coil and compressor will be the ultimate (Concluded on Page 19, Column 1)

BRING YOUR REFRIGERATION PROBLEMS TO



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Write for Bulletin ER, Bridgeport Thermostat Co., Inc., Bridgeport, Conn.

Air Circulation in Air Conditioning Of Auditorium

(Concluded from Page 18, Column 5) result and for this case we can select a compressor having the total required output at 34° refrigerant temperature, and a coil which will give the necessary cooling performance at 37° gas temperature. The differential must be allowed between the refrigerant temperature at the compressor and at the evaporator to offset the line pressure drop.

Selection of the heating coil and filter bank is a rather simple procedure and is usually explained in detail in manufacturer's performance data for the different types of equipment.

In this case we will use a single bank of copper finned steam heating coils with two rows of tubes in the direction of the air flow. A dual bank of viscous coated renewable type filters will be installed in the rear of conditioner housing.

The layout of the proposed system is rather simple. The only possible and practical location for the discharge openings will be in the ceiling. These openings will be equipped with a special design diffusing grille which will supply air to all parts of the conditioned space.

The air will have to be deflected in various directions. Not all the air can be blown horizontally as this may cause a reflection from the side walls and the seats closest to the walls will be in a cooler zone than in the center. These grilles may be of varied construction, but must be selected also to fit in the interior ceiling ornament.

Air will be recirculated back to the conditioner or exhausted to the outdoors from four large grilles. Two of these grilles will be located in the walls on either side of the stage and two will be located in each of the rear corners of the auditorium where air normally has a tendency to pocket.

The return ducts will lead into the conditioner room located over the south stage wing and entrance. The space will serve as a return air chamber.

A large propeller type exhaust fan will be used to exhaust the proper amount of recirculated air. This fan will be equipped with back-draft louvers and a variable speed control. Full speed will be used when the entire system is being used for ventilation only.

Under these conditions the recirculation air intake on the conditioner mixed air plenum will be closed off entirely and all fresh air will be handled by the conditioner.

Under maximum heating or cooling loads the fan will be either shut off or at minimum speed, and the larger part of the air in the conditioned room will be taken into the conditioner along with a smaller proportion of fresh air from the intake installed on the roof above the equipment.

The refrigeration machine is located in the basement, and controlled thermostatically. The blower controls are manual.

G-E Room Coolers Installed In Toronto Building

TORONTO, Ont., Canada—Individual General Electric air-conditioning units have been installed on each of the 20 floors in the Victory building, Toronto's newest office block, according to J. W. Bishop, of the air conditioning division of Canadian General Electric Co.

The main duct of each unit is built into the ceiling as an integral part of the structure, and branch ducts lead to every office and room on that floor.

Herrick Appointed Airtemp Dealer in Albany

ALBANY, N. Y.—William C. Herrick, of John H. Peterson, Inc., Airtemp distributor in this territory, has been appointed Albany county dealer for the equipment.

Thermo Valves
Expansion Valves
High Pressure Float Valves
Low Pressure Float Switches
Magnetic Stop Valves



Agfa Ansco Corp. Conditions New \$265,000 Binghamton Film Warehouse

BINGHAMTON, N. Y.—A completely air-conditioned \$265,000 film warehouse, four stories high and with 72,000 sq. ft. of floor space, has been constructed by Agfa Ansco Corp. near its film factory here. Cooling-water and insulation features mark the air-conditioning installation.

To maintain interior temperatures from 70 to 75° F. and constant humidity the year around, an automatically controlled air-conditioning system has been installed. Of the circulating air, 20% is drawn from outside, then filtered, washed, and humidified or dehumidified to the desired dewpoint.

Suction fans distribute the air, each floor having individual air-circulating units. Offices of the warehouse have separate conditioning controls.

Cooling of air is accomplished by use of well water that has a constant temperature of 52° F. throughout the year, and that can be supplied at a maximum rate of more than 300 g.p.m.

All water discharged from the coolers is sprayed on the roof. Evaporation tends to keep the wet roof cool and reduce the cooling demands of the floor below.

Pipe lines up to 16 inches in diameter and having a total length of one mile carry to and from the new building all water, steam, and disposal products needed for air-conditioning and warehouse services.

To prevent sweating of the walls in high humidities, the walls have

been constructed 12 inches thick, and made of a brick and hollow tile combination with insulating air space.

All internally exposed concrete work of the outside structure is insulated with cork and plaster or with terra cotta tile furring. Windows are double sashed, and the roof is insulated with cork. Floors are made of extremely hard, smooth concrete.

Glass blocks, installed in two window bays, are expected to eliminate window sweating and sash maintenance. And it is said that the highly diffused daylight passing through this type of glass has beneficial effects upon worker efficiency.

Because Binghamton has experienced two serious floods in recent years, flood-protection features have been included in the construction. Entirely waterproof electric wiring was installed on all levels within the flood-danger zone.

H. W. Sachs, chief engineer of Agfa Ansco Corp., has been in charge of the new building operations.

Stern to Distribute Carrier In New England Region

HARTFORD, Conn.—Stern & Co., Grunow distributor here, has been appointed distributor of Carrier air-conditioning equipment in Connecticut, Vermont, Rhode Island, and the state of Massachusetts with the exception of Boston and Cape Cod areas, reports Francis E. Stern, president.

17 Chicago Restaurants Install Air Control Systems in April

(Concluded from Page 1, Column 3) month, totaling 17. Largest of these was in Mandel Bros. department store, and amounted to 60 tons. Another, of 45 tons, went into the Night Club at 7500 S. Halstead St., and a 40-ton system was sold to the Grand Terrace Cafe.

Theaters were next in line during the month, the number of installations in this classification totaling 10, and including a 90-ton system in the Symphony theater, a 60-ton system in the Times theater, and 50-ton jobs in the A.B.C. and California theater.

Private and general office jobs contracted for during April totaled 13, of which seven were in the former and six in the latter classification. Largest general office job was in General Mortgage Investment Co., totaling 50 tons. Proctor & Gambill Co. and Balaban & Katz installed systems of 20 and 24 tons, respectively, and the rest were in the 3 to 5-ton class. Private office installations were all in the 1 to 5-ton range.

Five residential jobs were sold during the month, largest totaling 6 tons and being in the home of Lewis Barker, 10,036 Longwood Drive.

Stores accounted for eight of the month's installations, the total including Glassman Bros. department store, in which a 70-ton system will be operated; three drug stores, two of them in the Walgreen chain; two fur stores, and two shoe stores.

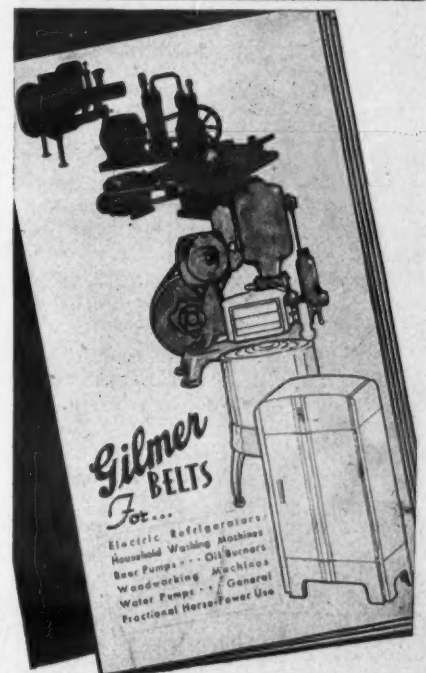
Only one industrial system was

sold during the month. It was contracted for by Oscar Heineman, 2701 W. Armitage Ave., and totaled 15 tons.

Two funeral parlors, a club-bar, a doctor's office, and a beauty shop were also on the month's air-conditioning sales list. One of the funeral parlor jobs totaled 20 tons, and was sold to H. D. Sheldon, Inc., 5708 W. Madison St.

Number of classifications into which April air-conditioning sales were divided is shown by the following tabulation:

Beauty Parlors	1
Doctors and Dentists	1
Club-Bar	1
Funeral Parlors	2
General Offices	6
Private Offices	7
Residences	5
Industrial	1
Restaurants	17
Stores, Department	1
Stores, Drug	3
Stores, Fur	2
Stores, Shoe	2
Stores, Misc.	1
Theaters	10
Total	60



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Write for Descriptive Bulletin

Ingenuity of Service Engineer Keeps Unit Working During Flood—Saving Meat Supply

PORTSMOUTH, Ohio—At 3 a.m. on the morning of Jan. 24, when the great Ohio River flood was nearing its crest in this area, Foodmerchant Ben F. Stewart took a temperature reading in his store cooler and found it near the 50° mark. He was nearly ready then to abandon hope for the 5,000 pound supply of fresh meats in his refrigerated cases and coolers, one of the largest remaining stocks of foods in the flood-ravaged city.

Fortunately situated on high ground, the Stewart store had been spared actual damage by the flood waters. But at midnight of Jan. 23 the sudden cessation of water service had menaced the store's 5,000-pound stock of fresh meats, since the cutting off of the water supply had stopped operation of the 1½-hp. Frigidaire water-cooled refrigeration compressor which furnished refrigeration for the cases and coolers.

How the compressor was put into operation despite the continued failure of the city water supply and the meat saved for Portsmouth's isolated citizens is the story of Foodmerchant Stewart's confidence in M. L. Steiner, a refrigeration contractor who had taken care of his equipment, and Steiner's ingenuity in rigging up an installation that would handle the job in the emergency period.

When Stewart, after making inquiries, found that the shutdown of the water supply was for an indefinite period, and that temperatures in his refrigerators were rising at an alarming rate, he confessed to his anxious wife that he was "desperate" for knowledge of what to do.

"I was half-dazed by the developments of the past couple of hours,

and had seemingly lost all power of thinking," wrote Stewart in a letter of appreciation to Steiner, "when my wife, who is usually cool-headed in a crisis, suggested that I call you.

"Why Steiner?" I questioned. "The system is okay, it's water we need. But I'll see."

Next problem was how to reach Steiner. Telephones were out of service and it would have been difficult to reach Steiner by foot, and then there was a chance that he might not be at his home.

The radio messages which had been directing flood rescue and relief efforts gave the food store owner an idea; scribbling out a radio message to Steiner he got it to the operator of nearby amateur radio station who was sending out all sorts of similar messages.

A friend of Steiner's who heard the broadcast conveyed the message to him, and in a few hours he was at Stewart's store. After sizing up the situation he left, stating that he would return shortly.

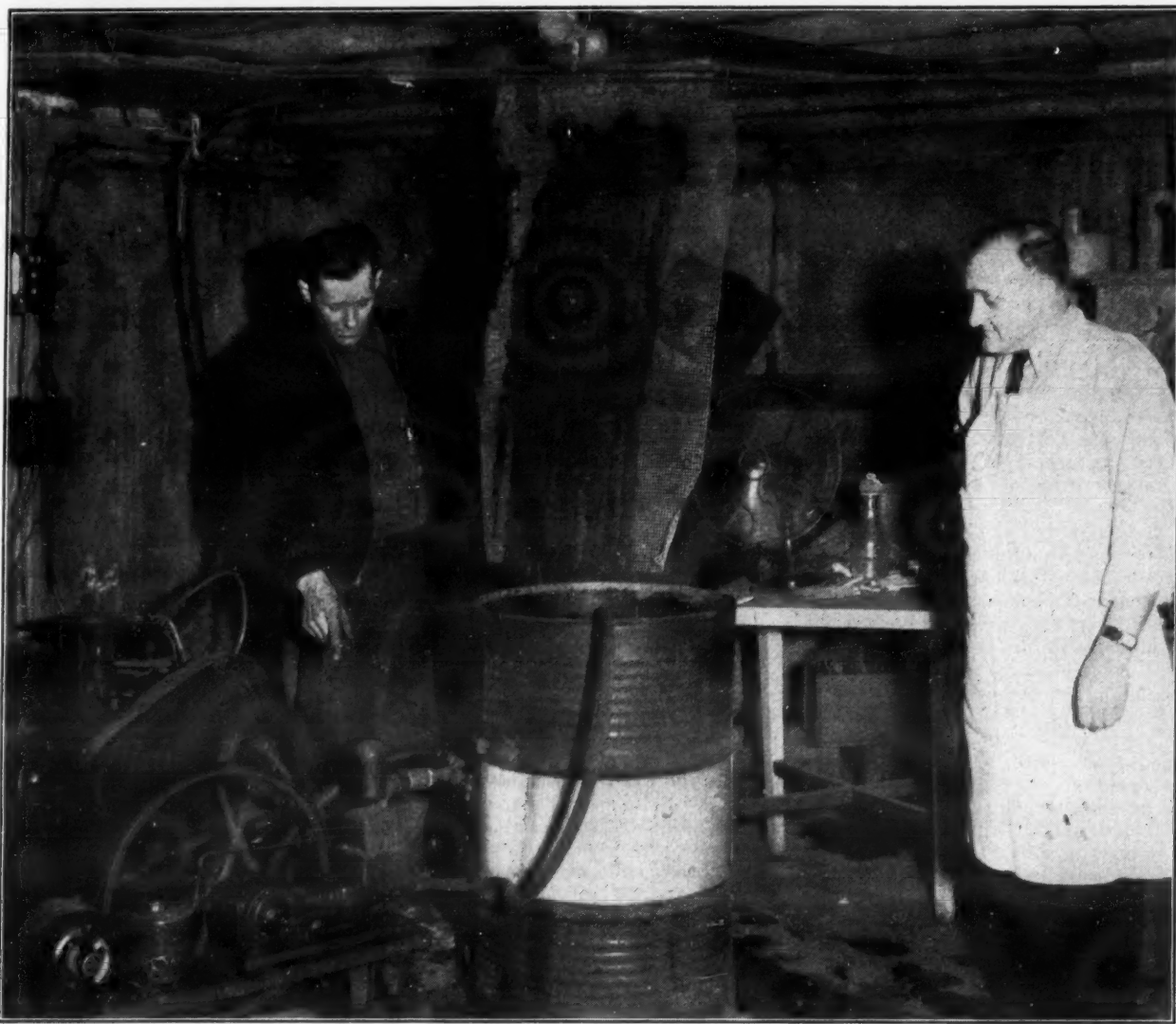
When Steiner showed up at the store with what Foodmerchant Stewart recognized as a shallow-well pump, which are used quite commonly in the Portsmouth area, he was frankly skeptical.

"How's that going to cool my cases and cooler," he queried the refrigeration contractor.

"Wait and see," said Steiner, who was busy gathering up more equipment consisting of a metal barrel which had been used by an oil company, a wide-mesh wire screen, a couple of pieces of rubber hose, some heavy wrapping cord, household electric fans, and a water strainer.

With this equipment Steiner rigged

How to Operate a Compressor When the Water Supply Is Off



M. L. Steiner, Portsmouth, Ohio refrigeration contractor, points to the pump which supplied water for a water-cooled condensing unit when the city water supply was shut off during the flood early this year. The discharged condensing water was made to trickle down the screen shown over the barrel, and two electric fans (one of which can be seen in the background) forced air currents through the water as it came down the screen.

up a contrivance which was in effect a home-made model of that type of evaporative condenser which re-cools by evaporative action of forced-draft air circulation the water which is used for condensing purposes, thus making possible the re-use of condensing water.

The installation, shown in the accompanying photograph, is described by Steiner as follows:

"I put one end of the rubber hose with a strainer on it into the barrel of water and connected it onto the pump intake. Another piece of the hose was run from the outlet of the pump to the condenser.

"Then another piece of hose was connected to the condenser water discharge and carried up to the ceiling, where it was tied by pieces of cord to any support we could find, and run over to the wire screen, which was suspended down over the barrel. The water trickled down the screen through which currents of air were being forced by electric fans.

"The water at the top of the screen was so hot you could hardly touch it; when it got to the bottom, it was really very cool.

"To operate the pump motor we 'jumped' some wires out of the switchbox on the wall.

"When I first started her up, I found the pump, which was a two-cylinder model of the horizontal type with about a 1½-inch bore, was too powerful for our hose connections to stand, since the hose was held on the pump and condensing unit connections only by clamps made out of pieces of ordinary wire. The force of the pressure tore 'em right off.

"Something had to be done to make the job workable in a hurry so I cut out a wooden plug and put it in the end of the hose that was in the barrel, leaving a very small hole in the center of the plug through which water could pass. This solved the problem.

"We couldn't very well fix up an automatic control operation, so we just let the system run continuously. Because of the way we had done the wiring, the hand switch on the control box would shut off the refrigeration unit and water pump at the same time."

By the time of day on Jan. 24 that the system was in operation the temperature in the cooler had climbed over 55, but the meat did not spoil, and when Steiner called the next morning, Stewart pulled him into the cooler to show him that the temperature in the box was near freezing.

The system was left in operation in the manner described above for several weeks and did a perfect job of refrigerating his meats, Stewart testified in his letter of appreciation to Steiner.

For several weeks after the flood, declares Steiner, he was kept busy about 18 hours a day, repairing electrical and refrigeration apparatus. Some of the equipment was in pretty bad shape; a couple of compressors were literally brought to him in the form of a basket full of parts, which he had to put back together again.

Methyl chloride units which had been water-logged were relatively easy to put back into commission, says Steiner. He cleaned them out with alcohol, blew methyl chloride through the system, and then put it in operation with a drier.

Sulphur dioxide systems presented more of a problem. If the compressor had been thoroughly water-soaked it became "stuck" through the formation of sulphuric acid. In several cases Steiner changed over household units that used sulphur dioxide. In making the changeover the refrigeration contractor used Johnson Motor Co. units.

Steiner got his start in refrigeration service work about 1930, when he struck out on his own after work-

ing for another electrical contractor for almost a decade.

He started out in refrigeration by servicing a few Welsbach machines, one of the most difficult of all refrigeration systems to repair because of its unusual design. He recalls that it was very difficult in those days to get any information, even from the factory, about refrigeration service methods.

"You sort of had to feel your way along, learning as you went," says Steiner. "I wrote to the factory time

Could You Have Figured Out A Way to Do It?

While the story on this page isn't exactly timely (Mr. Steiner says he has been so busy since the flood he just now has been able to get around to telling us about it) we think it should interest every refrigeration contractor and service man that reads it. More than that, it presents a challenge to the refrigeration service contractor—a challenge in the form of the question: "Do I know enough about refrigeration to have been able to work out a similar solution to the problem which faced Steiner?"

Steiner says that when he first started out in refrigeration work he was little more than a mechanic, learning how to fix systems, but not understanding the principles of refrigeration. He was ambitious to learn the fundamentals of refrigeration, however, and he took every measure he could to increase his knowledge—writing to manufacturers, grabbing at chances to go to manufacturer's service schools, etc.

One of the things he did was to subscribe to REFRIGERATION NEWS, and he has been a constant and assiduous reader for the past five years. He has also purchased several of the books published by Business News Publishing Co.

The editors hope that publication of this story will encourage other refrigeration dealers and service men to write in and tell us of their experiences which may be similar to Steiner's, or of some unusual problems in either selling or servicing which they have met and solved.

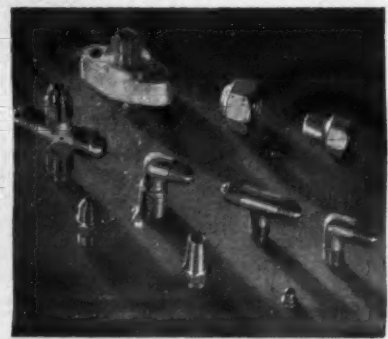
and time again but they didn't do anything about it. There was nothing much to read up on about refrigeration in those days.

"I finally got so I knew what to do, but what I wanted to know was why I was doing it—how a refrigeration system worked. I finally got to attend a service school at the Copeland factory in Mt. Clemens and learned about everything I had been wanting to know in the two weeks I was there."

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Wolverine Tube's Air-Cooled Office



Wolverine Tube Co., manufacturer of copper tubing used in refrigeration systems, recently moved its offices into a new, one-story, air-conditioned office building adjoining its tube mill in Detroit. (1) W. C. Gernhart of the sales department; A. B. Hard, in charge of advertising; and J. D. Colyer, vice president in charge of sales, confer over a piece of advertising copy; (2) Mr. Colyer, who is also president of the Refrigeration

Supplies and Parts Manufacturers Association, finds time each week to read AIR CONDITIONING AND REFRIGERATION NEWS; (3) Mr. Hard looks up from his desk to greet a visitor; judging from the pleased expression, the visitor probably isn't a salesman; (4) view of part of the general office, showing air-conditioning outlet grilles in the false beam. Ceiling construction is of a magnesite-cement mixture, which has sound-absorbing qualities.

Testing, Design, & Shipping Problems Discussed by PEI

(Concluded from Page 1, Column 1)

W. N. Harrison of the National Bureau of Standards, and chairman of the institute's standardization of tests committee, conducted a symposium on testing of enamels by explaining in detail the "Test for Acid Resistance of Porcelain Enamels," which the institute has just published. He explained that some modifications may be required before final acceptance is given the test.

"Design and Factors Affecting Hairlining," a paper by E. C. Greenstreet of Standard Gas Equipment Corp. was presented by B. T. Sweely of the Chicago Vitreous Enamel Product Co., because of Mr. Greenstreet's inability to attend. It dealt with proper design of porcelain enameled parts to eliminate defects, and represented several years' research which Mr. Greenstreet has done on the subject.

SHIPPING LOSSES

An outstanding presentation was made by Howard A. Wetter of the Chicago & North Western Railway Co. on "Reducing Enamel Ware Shipping Losses." He pointed out that transportation risks may be divided into two general classes.

"First there are those conditions occurring during trucking and stowing which may be termed handling risks," he explained. "These consist mainly of the distortion of containers during trucking; the breakage of contents due to accidental shocks to containers while being moved by hand; creasing or crushing of containers after loading in the vehicle due to weight of freight adjacent to or above it.

"Then there are those conditions which occur during the movement of the vehicle itself, and this is true whether the freight is carried by rail, truck, or water. These are vibration, end to end movement including shifting of other freight in the same vehicle, and side to side sway."

Mr. Wetter then went on to point out through the use of slides how to crate and pack porcelain enameled products in containers of sufficient strength to hold up under the weight of contents, with consideration given to factors of movement, vibration, and crushing within the load. He also pointed out the importance of proper labeling and marking of fragile products, and how to prepare porcelain enameled products for safe shipment.

Mr. Wetter said: "I know of no better thought with which to close this discussion than to plead for closer cooperation between the two most interested parties. This cooperation alone is certain to result in reducing enamelware shipping losses."

In his paper, "Milling Practices," E. C. Aydelott of the Benjamin Electric Mfg. Co. outlined features of

milling and made a plea for improvements in milling enamels.

"We all know the effect of poor mill room practice on our subsequent enameling operations, and we can emphasize the fact that the best known present-day milling practice is still none too good for the job to be done," said Mr. Aydelott.

It was announced that the subject of milling is of such importance that the institute's technical research section will soon start work on a milling project.

SPRAYING ENAMELS

The six major factors that should be considered in spraying enamels are the enamel itself, man or machine, spray gun, enclosure for spraying, type of ware, wages and incentive, it was brought out by Wesley G. Martin of the A. O. Smith Corp. in his paper "Factors Which Affect the Efficiency of the Spraying Operation." Summarizing his discussion, Mr. Martin recommended the following:

1. Provide the sprayer at all times with enamel which is constant in regard to gravity, mobility, and the yield point.

2. Select sprayers carefully and retain those who show definite ability to maintain constant application. Use mechanical spraying wherever possible and practical.

3. Provide good spray guns with nozzles chosen for the particular type of spraying necessary and see that the guns are kept in first-class condition.

4. Provide for good lighting and complete dust removal.

5. As the size of ware and complexity of surface increase, increase your efforts to help the sprayer in every way possible.

6. Provide a system of payment which will make diligent efforts on the part of the sprayer worthwhile. See that the additional rewards are based on more work of standard quality and not simply more work of lower quality.

That keeping a porcelain enameling plant clean is more than something to talk about was emphasized in the presentation, "Enamel Shop Housekeeping," by W. H. Pfeiffer of Frigidaire Corp.

"The fair consideration of good enamel shop housekeeping," said Mr. Pfeiffer, "implies not only the adage 'a place for everything and everything in its place' with plenty of janitors to keep the dirt moving, but also a number of other factors which contribute to efficiency, safety, and success in the enameling process."

"Oftentimes the enameler must not only look out for his own housekeeping but that of other divisions of the plant which perform operations on the ware either before or after enameling."

"All of us will agree that cleanliness is necessary and our first thought at the mention of the word will be of the dirt which may be on the floors, benches, machines, or other equipment. Yet this dirt may play only a minor part in causing defects in the enamel during firing."

"Attempts to reduce black specking in cover coat enamels by general

THE BUYER'S GUIDE



"And You Don't Sit in the Middle of a Hurricane—"

That is just Walter Honeychurch's way of telling you that there is no direct air blast from a Peerless Comfort Cooler. "Walt" is the "High Mogul" of air conditioning sales for Peerless.

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and thorough cleaning of all beams, equipment, and floors have generally been fruitless for the reason that these dirt particles tend to cling to each other and cannot be induced to float in the air again without some rather violent agitation."

F. E. Hodek, of General Porcelain Enameling & Mfg. Co. and chairman of the forum committee, paid tribute to the members of his committee, who have been working on plans for the forum since last fall. They are: Dr. Andrews, Prof. R. M. King of Ohio State University, and J. E. Hansen of the Ferro Enamel Corp.

He also pointed out that the second forum will be conducted at Ohio State University, and expressed his appreciation for the cooperation he and his committee had received from members of the porcelain enameling industry and the speakers who had made the program possible.

PRODUCTION PROBLEMS

Subjects discussed at the May 7 session were: "Furnaces," by F. S. Markert of Ferro Enamel Corp.; "Production of One Cover Coat Ware," by Herman L. Cook of Norge Corp.; and "Enamel Shop Production Problems," by Jay Simons of Westinghouse Electric & Mfg. Co.

Mr. Markert's paper outlined developments in enameling furnaces during the last few years, with particular emphasis on the radiant tube type of furnace.

"Furnace improvements during the next several years should be fast and perhaps radical in many cases," the paper pointed out. "We are all accumulating more experience, our field and products are ever increasing and with burning the most important and expensive operation, more serious study to furnaces will be demanded, and better designed and performing furnaces will be the result."

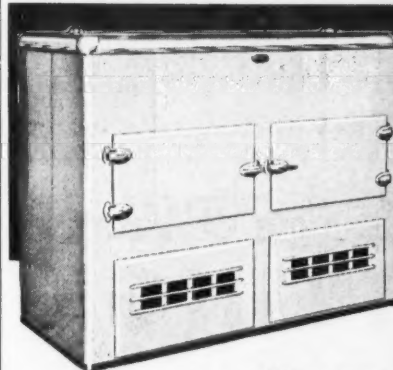
Mr. Simons followed the production of a porcelain enameled product through its various processes, emphasizing the importance of good plant layout and efficient production methods.

"The principal functions of an enameling department, in order of usual importance, are to meet production requirements, to maintain the quality of finish required, and to do both at a cost acceptable to the management," he said in summarizing.

As chairman of the institute's production control section, Mr. Cook announced that a survey of one cover coat enamels had been conducted by his section and that results of the survey would be published for distribution to the industry.

"The point most generally expressed by the men commenting on the one-coat problem was design," Mr. Cook reported. "There can be no sharp edges or small radii. Sharp embosses generally set up strains which tear badly when the heavier coating is applied. No piece can be so flimsy that that handling or the distortion of burning will cause the enamel to tear."

"In many cases increasing the metal thickness slightly will give the piece enough strength to withstand tearing or straining caused by handling or firing. Loose metal and 'oil can' effects produce tearing and strain lines which are hard to cover with even a second coat of white. Therefore, wear should be expressly designed for one coat. Too often ware designed for beauty is practically impossible to produce in one coat of white."



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THE BUYER'S GUIDE

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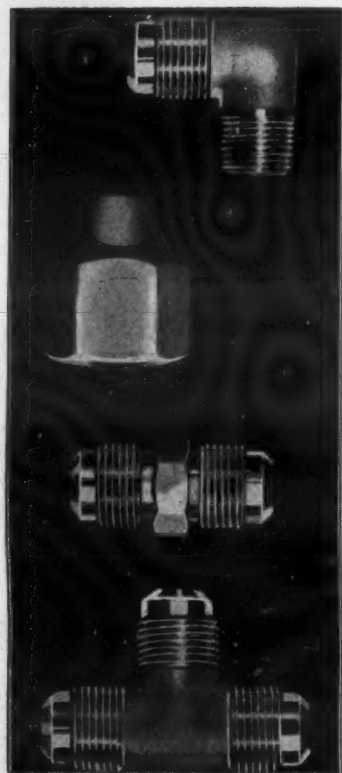
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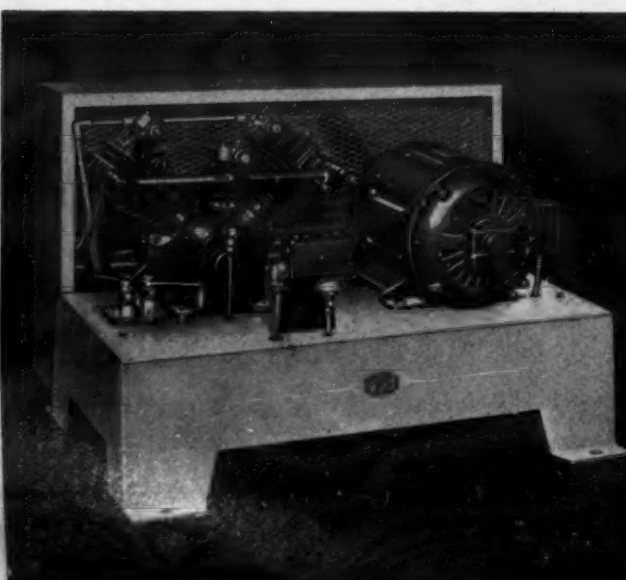


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DEFIANCE OHIO U.S.A.

Air Conditioning Made Easy

By F. O. Jordan

Differences Considered in Selection Of Coils for Heating or Cooling

SECTION 15 (Cont.)

Design of Equipment

C—Coils

Since the function of the heating coil is merely to do sensible work, the ideal heating coil is the coil which has the greatest sensible capacity per unit of coil weight or volume, provided that resistance to airflow is within reason.

The cooling coil must do latent work as well as sensible work, both functions being of equal importance. This fact is the cause of two very important considerations which do not exist in heating service. The first of these is the necessity of obtaining the latent-to-total ratio usually required without the necessity of resorting to extremely low refrigerant or water temperatures.

Since the latent capacity of the coils is dependent largely upon the temperature differential between dewpoint and average coil surface, and since low refrigerant temperatures penalize the condensing unit, while low water temperatures are expensive or often impossible to obtain, it is very important that the cooling coil be designed with its average surface temperature as close as practicable to the average refrigerant or water temperature within the coil.

In other words, the problem is not to design for maximum sensible capacity per coil unit, but to design for maximum latent capacity at a given average refrigerant or water temperature. In this way the latent-to-total load ratios met in actual practice may be balanced at a higher refrigerant temperature, a condition which tends to reduce the first and operating cost of the condensing unit.

Since the condensing unit cost usually amounts to approximately 10 times the cost of the coil, and since the higher refrigerant temperature favors the condensing unit, a lower overall first cost usually will be obtained when a coil is used which permits operation at a higher refrigerant temperature, even though the cost of the coil is increased somewhat.

When the coil is to be used with well water, the characteristic of obtaining a high latent-to-total capacity ratio at fairly high water temperatures is very desirable because of the common difficulty of balancing the usual latent-to-total ratio on projects of moderate and heavy occupancy concentration with the well-water temperatures usually obtained.

This characteristic of high latent-to-total capacity ratio is obtained without the necessity of low refrigerant temperatures by using heavy fins well bonded to the tube, and by using large tubes spaced fairly close together.

By this arrangement the resistance

to heatflow from air to refrigerant is reduced, and average length of heat travel through the fin is minimized. This results in an average surface temperature for the entire coil which is not far above the average refrigerant temperature within the coil. With the direct expansion coil, it is very important that the resistance to refrigerant flow be kept low (two to four pounds) because a low resistance will allow a higher suction pressure at the compressor with a given average refrigerant temperature in the coil.

The second of the considerations mentioned above for the cooling coil lies in its ability to evacuate rapidly the moisture resulting from its own latent work. If this is not done, its capacity of performing either sensible or latent work is seriously impaired. The results of holding moisture in the coil are as follows:

1.—Capacities are reduced because of interference with the exchange of heat between coil surface and air.

2.—Resistance to airflow is materially increased, so that capacities are reduced by the resultant reduction in airflow, or fans must be speeded up until their operation becomes noisy.

3.—The moisture which is held on the coil is re-evaporated during the periods when the thermostat has stopped the condensing unit or shut off the waterflow or refrigerant flow through the coil. This is very serious for the following reasons:

(a) The re-evaporated moisture is returned to the conditioned space, thus raising the room humidity and so defeating one of the chief purposes of air conditioning.

(b) The room odors which have been absorbed from the air by this

moisture are returned to the room or dried onto the coil surface instead of being sent to the sewer where they belong. This does not happen when the moisture is properly evacuated from the coil surface. The result is a foul odor which has become common cause for complaint against air conditioning.

Rapid removal of moisture may be obtained as follows:

(a) Pass the air through the coil in such a direction that it assists rather than impedes the flow of moisture from the coil surface. This means that the airflow should be downward or horizontal.

(b) Use fins which are continuous from top to bottom so that the sluiceway is formed down which the moisture will flow rapidly.

(c) Do not space fins too closely together. Spacing should be 5 to 6 fins per inch.

(d) Coils should be tilted slightly so that droplets will not cling to the lower edge, but run to the low end and drop off.

(e) Surfaces should be used to which moisture does not readily adhere.

Other desirable points are as follows:

1.—The load and resistance to refrigerant flow through each coil section or refrigerant circuit should be the same. If this is not true, a separate expansion valve must be used for each circuit to prevent "flooding" through circuit of light load or low resistance with resultant shutting off of the expansion valve and "starving" of circuits of heavy load or high resistance.

However, if loads and resistances of all parallel circuits are kept the same, one expansion valve may be used satisfactorily, provided that the intake manifold is of the proper size and properly arranged. Locating the liquid heater in a horizontal position so that the individual liquid feeds start at the same level, and making each individual feed the same length, will assist materially in obtaining equal distribution of refrigerant.

The use of one expansion valve lowers cost considerably and simplifies tremendously the task of obtaining a good field adjustment. This requirement demands either parallel flow or counterflow of air and refrigerant.

2.—In general, refrigerant should be fed at the bottom and taken off at the top of the coil.

From the above discussion, the following coil is indicated:

Tubes—3/8 inch for small coil and (Concluded on Page 23, Column 1)

Table 4—Values for Use in Designing Equipment

Compressor Piston Speeds	450 to 900 f.p.m.
Connecting Rod Bearing Pressure	800—1,200 lbs. per sq. in.
Wrist Pin Bearing Pressure	1,200—1,800 lbs. per sq. in.
Main Bearing Pressure	500—700 lbs. per sq. in.
Compressor Clearance Volume	1 to 5%—the smaller percentage being for the larger compressors.
Cu. In. Piston Displacement per Minute per Ton	6,500—7,000, the former value being for the lower gas velocities through valve ports.
Power Consumption	0.95—1.1 brake horsepower per ton.
Condensing Water Consumption	1 1/2 to 3 g.p.m. per ton, the higher value being for lower head pressures and higher inlet condensing water temperatures.
Freon Charge for System	6 lbs. to 8 lbs. per ton.
Liquid Receiver Storage Capacity	One cu. ft. per 5 tons capacity.
Freon Circulation	250 lbs. per hour per ton.
Face Area of Air-Conditioning Coil 6 Inches Deep	1 sq. ft. per ton.
Face Area of Air-Conditioning Coil 9 Inches Deep	0.8 sq. ft. per ton.
Face Area of Air-Conditioning Coil 12 Inches Deep	0.6 sq. ft. per ton.
Tube Surface of Shell and Tube Freon Condensers	4 to 5 sq. ft. per ton, the smaller surface required applying to the higher water velocities (250 f.p.m.) through the tubes.
Tube Surface of Shell and Tube Freon Water Cooler	6 to 10 sq. ft. per ton, the smaller surface applying to the higher water velocities (250 f.p.m.) through the tubes.
Inner Tube Surface of Double Tube Freon Condensers	2.5 to 3.5 sq. ft. per ton, the smaller required surface applying to the higher water velocities (250 f.p.m.) through the tubes.
Inner Tube Surface of Double Tube Freon Water Coolers	5 to 7 sq. ft. per ton, the smaller required surface applying to the higher water velocities (250 f.p.m.) through the tubes.
Usual Condenser or "Head" Pressure for Water-Cooled Condenser	120-150 lbs. per sq. in., the higher pressures being used in localities where available condenser water temperatures and/or costs are higher.
Usual Condenser or "Head" Pressure for Air-Cooled Condenser	160-180 lbs. per sq. in., the higher pressures being used in localities where air temperatures are high.
Usual Condenser or "Head" Pressures for Evaporative-Cooled Condenser	150-160 lbs. per sq. in.

Learn the Fundamentals Now! Read 'Air Conditioning Made Easy'

Published on this and the preceding page is a continuation of Section 15 of AIR CONDITIONING MADE EASY, a manual by F. O. Jordan, air-conditioning editor of the NEWS and former head of the air-conditioning development laboratory of the Airtemp division of Chrysler Corp. The book is being published in serial form in the weekly issues of AIR CONDITIONING AND REFRIGERATION NEWS.

AIR CONDITIONING MADE EASY is a manual and textbook on air-conditioning engineering practice. The section continued in this issue—"Design of Equipment"—gives an indication of the wide scope of the book. It is a manual which deals not only with the engineering principles of air-conditioning and field application procedure, but also with the actual design of equipment and even the proper organization of personnel for a company getting into the field.

As such, AIR CONDITIONING MADE EASY should be widely useful to individuals already in the air-conditioning field who want to broaden their knowledge of it, to students who are intending to make air conditioning their career, and to executives of manufacturing or distributing organizations who are contemplating

getting into the air-conditioning business.

The following instalments of AIR CONDITIONING MADE EASY have already been published in the NEWS:

What Is Air Conditioning?—Sept. 23.

Section 1, Introduction, and Section 2, Definitions and Simple Thermodynamics—Sept. 30.

Section 3, Coil and Water Cooler Performance—Oct. 7 and 14.

Section 4, Condensing Unit Performance—Oct. 21.

Section 5, Air Movement and Ventilation Requirements—Oct. 28.

Section 6, The Complete Air-Conditioning System for the Cooling Season—Nov. 4, 11, 18, and 25.

Section 7, Heating—Dec. 2, 9, 16, 23, 30, Jan. 6, 13, 20, 27, Feb. 3, 10, 17, 24, March 3, and 10.

Section 10, Don'ts—March 17 and 24.

Section 14, Controls and Zoning—March 31, April 7, 14, and 21.

Section 15, Design of Equipment—April 28, May 5, and May 12.

Selection of Humidifiers, Filters, Fans, Motors, Drives & Controls

(Concluded from Page 22, Column 5)
¾ inch for large coils, spaced 1¼ to 1½ inches on centers, and not over 30 feet long for ¾ inch tubes, or 50 feet long for ¾ inch tubes. Generally, a staggered arrangement is more effective, but offers greater resistance to airflow.

Fins—10 to 15 thousandths, spaced 5 to 6 per inch, well bonded to tube and continuous from top to bottom. A surface treatment for the complete coil which will lessen the adherence of moisture and prevent deterioration is desirable.

Airflow—Downward or horizontal. Manifolding for the Direct Expansion Coil: Manifolding should be such that one expansion valve may be used for each coil, or so that all refrigerant circuits are of the same length and loading. Refrigerant should be fed at bottom and taken off at top. Resistance through manifolding must be kept very low.

D—Humidifiers

Humidifiers may be of either the water spray or the steam jet or grid type. The chief disadvantage of the steam jet is that sometimes oily or odorous steam is encountered which may contaminate the air stream. Care must be taken that the steam jet type of humidifier is not noisy.

Chief disadvantages of the water spray type are the difficulty of preventing water from being carried over by the airstream, the difficulty of preventing clogging, the tendency to deposit impurities from the water upon the surfaces upon which it impinges, and the difficulty of actually obtaining sufficient vaporization of moisture in the limited spray chamber space generally available.

With any humidifier must be provided some means of preventing room humidities which would be undesirable or which might damage furnishings or decorations.

A very satisfactory location for the humidifier is at the leaving air side of the heating coil where the airstream is hot and at the entering air side of the summer air-conditioning coil so that this coil can act as a moisture eliminator.

E—Filters

Filters should be of a standard make and size, easily available on the market, and should be so located and arranged as to be easily accessible for replacement or service, without the necessity of removing screws or of doing other work of dismantling.

In general, filters may be of the metal wool, glass, paper, or other conventional type, although for very small units delivering less than 250 c.f.m., special filters such as fine mesh screens of very low resistance to airflow may be necessary.

F—Fans

The fan tip speeds and outlet velocities which are advisable for various

services and types of units are listed above under "Design and Construction" of air-conditioning units. For very small cheap units using very shallow coils, propeller type fans may be used.

However, in practically all cases, multiblade blower type fans must be used. Fans should be selected for specially quiet operation, rather than for extreme efficiency. Because of the noise consideration, quiet sleeve bearings should be used and fans and shafts should be in perfect balance.

G—Motors & Drives

Motors should be of a very quiet operating sleeve-bearing "40 degree" type, either of the totally enclosed or conventional ventilated style, and either repulsion induction single phase, squirrel cage multi-phase, or compound wound direct current type. Except for direct drive, adjustable slide rail bases should be provided.

Motors may be single speed or multispeed, multispeed being desirable for certain units as this feature enables capacities to be changed to balance changing loads. Motors for residential service should be of the condenser type shielded against radio interference.

Lubrication of fans and motors should be of a type which requires the absolute minimum of attention.

Both direct and V-belt drive is used, the belt drive having the very desirable feature that it allows the capacity of the unit to be changed to suit the project upon which it is to be installed merely by changing pulley ratios.

Belt drive is practically a necessity for the unit which is to be used with duct work so that the fan speed may be adjusted to suit the resistance of duct systems of various lengths.

H—Controls

Controls are discussed in Section No. 14.

Where the single station control system is used, a very satisfactory arrangement is to mount the room thermostat and the room humidistat (if the latter is used) on an instrument panel in the return air inlet from the room, so that the instruments are controlled by the condition of the air from the room to be continued. The chief advantage of this arrangement is that the air-conditioning unit becomes a more complete package which requires less installation labor.

Design Factors

The factors in Table 4 are average approximate values which generally may be used in design of equipment for air-conditioning service only.

Information concerning fan speeds and outlet air velocities, coil characteristics, and air-delivery requirements for air-conditioning units is given above "Design and Construction of the Air-Conditioning Units."

Standard Shades Set Up By Color Conference

NEW YORK CITY — Housewives will soon be able to assemble a kitchen or bathroom with accessories in exactly the same shades. This fact was assured when representatives of manufacturer, retailer, and consumer groups, meeting at Hotel Pennsylvania in a conference called by National Bureau of Standards, Department of Commerce, approved a set of standard color shades to be used in the manufacture of these articles.

Standard kitchen shades approved were white, kitchen green, ivory, delphinium blue, royal blue, and red. Approved bathroom colors included white, bath green, orchid, ivory, maize, bath blue, and royal blue.

Following the conference, manufacturers announced that they were planning to start production of articles in the standard shades as early as possible.

Plaques of the colors probably will be available at the Bureau of Standards in Washington, D. C. by July 1, and for display at housewares shows in Chicago and New York this summer. Sample sets will be on display at offices of National Retail Dry Goods Association here, and at the Merchandise Mart in Chicago.

The standardization project is said to be the first problem of color coordination to be undertaken jointly and voluntarily by representatives of consumer, retailer, and manufacturer. It results from conferences called by Housewares Color Standards Committee of the Merchandise Division of N.R.D.G.A. with manufacturers last fall.

Alter and Davin Attend Griffith Meeting

CHICAGO—Harry Alter and J. J. Davin, director of sales and sales promotion manager, respectively, of General Household Utilities Co., recently attended the dealer meeting of Griffith Distributing Corp., Indianapolis Grunow distributor, where more than 200 dealers and salesmen met at Hotel Gibson to hear Grunow's spring selling plans.

Mr. Davin also attended the dealer meeting held by Ridge Co., South Bend, Ind., Grunow distributor, at Columbia Athletic Club. Everett Ridge and his field salesmen, Messrs. Kramer, Wilson, and Pervis, handled all details of the meeting. Mr. Walz, Ridge's chief accountant, with his wife and twin daughters, presented a musical program.

Tri-City Electric Co. Named G-E Dealer in Derby, Conn.

DERBY, Conn.—Appointment of Tri-City Electric, Inc., as General Electric dealer has been announced by Androphy Electric Co., Ansonia, G-E distributor for the lower Naugatuck valley. Eckhardt's Furniture Store, Seymour, was appointed G-E dealer several months ago.

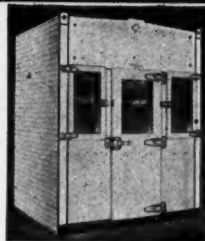
The Androphy company has placed an order for its fourth carload of G-E refrigerators, according to A. E. Androphy. The company has won several nationwide G-E dealer contests for merchandising of washers and other appliances during the past several years.

Dunkley & Satchell Join Cleveland G-E Supply

CLEVELAND — Howard Dunkley and Ray Satchell have been added to the sales force of General Electric Supply Corp. here.

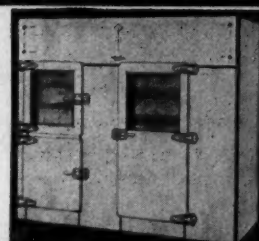
THE BUYER'S GUIDE

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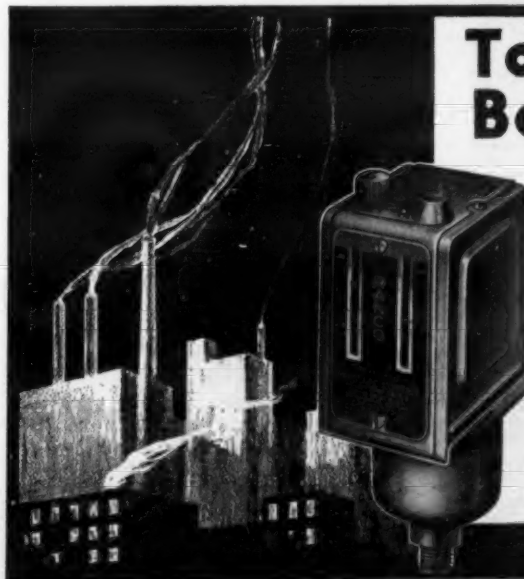
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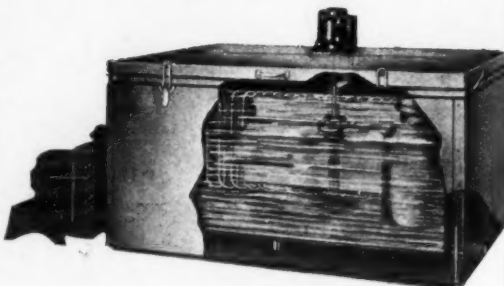
STEAM BOILER CONTROLS



THE BUYER'S GUIDE

HOW VERTI-COIL CAUSES Natural Water Circulation Lowers Milk Cooling Costs

HERE'S why the new Verti-Coil cabinets are the most efficient on the market. Water around the coil chills quickly, sinks to the bottom. Warm water at top flows naturally to take its place. This natural circulation of water carries heat to the coil faster, cools milk more quickly, ends usual 20° difference between top and bottom water found in old style horizontal coils. Temperatures in Verti-Coil cabinet will not vary one degree from



front to back, even when an agitator is not used. Quick cooling for the dairy-farmer—quick sales for you. Write for dealer proposition.

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DAYTON, OHIO, U. S. A.

Refrigerant Pipe Size Table

The following table is reprinted from the book, "Certified Refrigeration Standards and Engineering Data," published by the Chicago Master Steam Fitters' Association. The material is copyrighted and is reprinted here with the permission of the association.

The book, which contains engineering and standards data for use by the refrigeration and air-conditioning engineer, is available at \$2.50 a copy.

Table No. 17 shows the standard pipe size required for refrigerant lines. The main figures below the double rule are B.t.u. per hour. Gas line capacities are in lightface type. Liquid line capacities are in boldface type. The figures in parenthesis at the right in each column are the pounds of refrigerant to fill 100 feet of pipe.

Maximum velocities are shown in

feet per minute—lightface type for gas—boldface type for liquid.

Use column headed 40° F. for suction gas temperature over 25° F.

Use column headed 5° F. for suction gas temperature under 25° F.

EXAMPLE: Assume an air-conditioning load of 34,000 B.t.u. per hour with Freon. What size pipe lines are required and how much refrigerant is necessary to fill the liquid line?

ANSWER: Under Freon read down the 40° F. column to the first lightface number that equals or exceeds 34,000, which is 36,000. Read right to the pipe size column showing 1-inch pipe for the suction line.

For the liquid line read down the Freon column to the first boldface number that equals or exceeds 34,000, then right to the pipe size column which shows 3/8-inch pipe required,

and it will hold six pounds of Freon per linear foot.

NOTE: Refrigerant lines 3/4 inch and under, exceeding 25 linear feet should increase one size, 26 to 75 linear feet; two sizes, 76 to 150 linear feet.

Refrigerant lines 1 inch to 2 inches inclusive, exceeding 50 linear feet should increase one size, 51 to 100 linear feet; two sizes, 101 to 200 feet.

Refrigerant lines 2 1/2 inches and over, exceeding 100 linear feet should increase one size, 101 to 200 linear feet; two sizes, 201 to 300 linear feet.

A ton of refrigeration is heat removal at the rate of 12,000 B.t.u. per hour. To convert the B.t.u. figures to tons of refrigeration, divide by 12,000.

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Specific Gravity 0.68	Specific Gravity 1.46	Specific Gravity 0.99	Specific Gravity 1.44	Specific Gravity 0.99	Velocities Maximum PIPE SIZE NOMINAL Tube O.D. 1/8 Larger
5000 225 3600	4600 150 3000	3800 180 2700	2200 150 1600	900 225 700	
5° F. 40° F.	5° F. 40° F.	5° F. 40° F.	5° F. 40° F.	5° F. 40° F.	
	14 000	12 000	9 800		1/8" Liquid
	800 1 200	1 000 1 500	600 900		1/8" Gas
120 000 (2)	55 000 (3)	48 000 (2)	18 000 (3)		1/8" Liquid
	4 800 6 000	6 000 8 400	3 600 4 800		3/8" Gas
204 000 (3)	96 000 (7)	84 000 (5)	36 000 (6)		3/8" Liquid
24 000 36 000	8 400 10 800	9 600 12 000	6 000 9 600	18 000 24 000	1/2" Gas
360 000 (5)	168 000 (12)	144 000 (8)	60 000 (11)	240 000 (5)	1/2" Liquid
48 000 72 000	18 000 24 000	20 400 30 000	12 000 19 200	36 000 48 000	3/4" Gas
732 000 (12)	336 000 (26)	300 000 (18)	120 000 (24)	600 000 (12)	3/4" Liquid
96 000 132 000	32 400 42 000	36 000 54 000	24 000 36 000	60 000 84 000	1" Gas
1308 000 (21)	600 000 (46)	528 000 (31)	216 000 (43)	900 000 (21)	1" Liquid
144 000 204 000	48 000 66 000	60 000 84 000	36 000 55 200	96 000 132 000	1 1/4" Gas
2040 000 (32)	960 000 (72)	840 000 (48)	336 000 (69)	1300 000 (32)	1 1/4" Liquid
204 000 300 000	72 000 96 000	84 000 120 000	54 000 79 200	144 000 180 000	1 1/2" Gas
3168 000 (46)	1344 000 (104)	1200 000 (69)	480 000 (97)	1920 000 (46)	1 1/2" Liquid
360 000 528 000	120 000 168 000	144 000 204 000	96 000 138 000	240 000 324 000	2" Gas
5052 000 (82)	2352 000 (184)	2100 000 (121)	840 000 (172)	3600 000 (82)	2" Liquid
528 000 756 000	180 000 240 000	204 000 300 000	132 000 198 000	360 000 480 000	2 1/2" Gas
8160 000 (128)	3840 000 (288)	3360 000 (192)	1344 000 (256)	5200 000 (128)	2 1/2" Liquid
816 000 1200 000	288 000 360 000	324 000 468 000	216 000 312 000	540 000 720 000	3" Gas
1080 000 1560 000	384 000 480 000	444 000 636 000	288 000 420 000	720 000 984 000	3 1/2" Gas
1440 000 2040 000	480 000 648 000	576 000 816 000	372 000 540 000	960 000 1272 000	4" Gas
2112 000 3024 000	720 000 960 000	816 000 1200 000	528 000 792 000	1440 000 1920 000	5" Gas
3264 000 4800 000	1152 000 1440 000	1296 000 1872 000	864 000 1248 000	2160 000 2880 000	6" Gas

QUESTIONS

Commercial Hardware

No. 3052 (Dealer, Ohio)—"Can you give us the names of some manufacturers of refrigerator hardware, for meat coolers, grocery boxes, etc.?"

Answer: We suggest you contact the following companies:

Kason Hardware Corp.
127 Wallabout St., Brooklyn, N. Y.
Dent Hardware Co.
Fullerton, Pa.
Grand Rapids Brass Co.
90 Scribner Ave., N. W., Grand Rapids.
Winters & Crampton Corp.
Grandville, Mich.

Gleason's Address

No. 3053 (Advertising Agency, Illinois)—"Please send us the address of F. J. Gleason, Secretary of the Refrigeration Supply Jobbers Association."

Answer: Address, Mr. Frank J. Gleason, Secretary, Refrigeration Supply Jobbers Association, 2707 David Stott Bldg., Detroit, Mich.

Accessory Manufacturers

No. 3054 (Distributor, New York)—"Will you please give us the addresses of companies who sell refrigerator dishes, crisper pans, etc.?"

Answer: The following companies manufacture refrigerator dishes, vegetable pans, etc.:

Columbian Enameling & Stamping Co.
Beech St., Terre Haute, Ind.
Federal Enameling & Stamping Co.
Thompson Ave.,
McKees Rocks, Box 225, Pittsburgh, Pa.
Hoosier Lamp & Stamping Co.
1511 Read St., Evansville, Ind.
McKee Glass Co.
Bullitt Ave., Jeannette, Pa.
Polar Ware Co.
Lake Shore Rd., Sheboygan, Wis.
Scurlock Kontanerette Corp.
Merchandise Mart, Chicago, Ill.
Vollrath Co.
18th St. & Michigan Ave., Sheboygan, Wis.

Maker of 'Unitemp'

No. 3055 (Distributor, Pennsylvania)—"We are interested in obtaining the name of a manufacturer of a large water-cooling device, consisting of four or five tanks, used principally by bottling companies. We believe that this organization is located in either Atlanta, Georgia, or New Orleans."

Miscellaneous

Air Control Equipment

No. 3056 (University, New Jersey)—"As you are perhaps aware, we are just completing the last numbers of the correspondence course in Air Conditioning for the University. This text makes extensive use of manufacturers data, cuts and the like which have been freely offered. However, I have been unable to secure addresses of a number of concerns despite my search in publications like Thomas's Register, the A.S.H.V.E. Handbook, and others."

"Can you tell me who makes ice equipment for air conditioning cooling (of the type used by some of the railroads, etc.), who makes McCord Pentane system, who makes airplane conditioning equipment? I should greatly appreciate it if you can supply information on these items or suggest other sources for it."

Answer: General Refrigeration Sales Co., Beloit, Wis., manufactures air-conditioning equipment for aeroplanes, in which mechanical refrigeration equipment is used.

McCord Radiator & Mfg. Co., 2587 E. Grand Blvd., Detroit, Mich., makes the McCord Propane system.

Ice Cream Cabinet Lids

No. 3057 (Supply Jobber, British Columbia, Canada)—"We wish to locate a source of supply for ice cream cabinet lids of various types, i.e., round, square, oval, etc. We would appreciate very much a list of manufacturers of this item."

Answer: The Dairy and Ice Cream Machinery and Supplies Association, Inc., 232 Madison Ave., New York, N. Y. has named the following companies as manufacturers of ice cream cabinets lids and parts:

American Hard Rubber Co.
11 Mercer St., New York, N. Y.
The Aetna Rubber Co., Cleveland, Ohio.
Ludwig-Saha Co., Inc.
Sharon Hill, Pa.
Sheip & Vandergrift, Inc.
812 No. Lawrence St., Philadelphia, Pa.

Replacing Multiple System

No. 3058 (Dealer, Ohio)—"Sometime ago in the REFRIGERATION NEWS the

writer remembers an article giving definite figures showing savings in refrigeration cost to an apartment house owner after he had replaced multiple system with individual refrigerators."

"Can you furnish us with a copy of this article?"

"At this time I have a prospective customer who has a 30-family apartment building equipped with multiple hook-up refrigeration system. This system is in need of repairs and the expense involved will be approximately \$750. We have advised our customer to replace this equipment with new individual refrigerators and would like to have this article to show approximate savings."

Answer: The article entitled "Savings of Self-Contained Units Over Multiple System Total \$2,561 on 96 Machines in One Year" was published in the Oct. 7, 1936, issue of AIR CONDITIONING AND REFRIGERATION NEWS.

Domestic Manufacturers

No. 3059 (Manufacturer, Massachusetts)—"Will you please be so kind as to inform us who makes the Gilfillan, Continental, Gaffers & Sattler refrigerators, also the addresses of the companies."

Answer: Gilfillan refrigerators are manufactured by Gilfillan Bros., Inc., 1815 Venice Blvd., Los Angeles, Calif.; Gaffers & Sattler by Gaffers & Sattler, 4561 E. 50th St., Los Angeles, Calif.; and Continental by the Continental Refrigerator Corp., Fond du Lac, Wis.

Refrigerant Masks

No. 3060 (Dealer, Cuba)—"We would thank you to send us by return mail your catalog on masks, goggles, etc., together with prices and best discounts, as we are anxious to get in contact with the right firm in order to cover the entire safety line, i.e. in paints, sulphur acid, gas fume, CO₂, etc."

Answer: Contact Chicago Eye Shield Co., 2352 Warren Blvd., Chicago, Ill., for information on refrigerant masks.

Trailer Refrigeration

No. 3061 (Dealer, Arizona)—"I should greatly appreciate any and all detail you may be able to give me re 'trailer refrigeration' (electrical) you noted not long ago in REFRIGERATION NEWS."

Answer: Contact the Aerflo Co., 423 Reid Bldg., 138 Cadillac Sq., Detroit, Mich., manufacturer of trailer refrigeration equipment.

'Remanufactured' Box Demand Evidenced by Rising Activity at Federal Refrigerator's Factory

By W. H. Long

NEW YORK CITY—Evidence of the rising domestic and foreign demand for remanufactured mechanical refrigerators is found in the busy factory of Federal Refrigerator Corp. at 57 East 25th St. here, where last year approximately 3,000 used boxes of 1930-1936 vintage were remanufactured for American department stores and for the company's distributorships in foreign countries.

"There are several firms operating today who advertise 'rebuilt' or 'reconditioned' or 'renewed' refrigerators," said Mr. A. I. Brickner, president of the firm, "but our remanufacturing process is not to be confused with any of these. We have spent five years developing a process which we believe to be entirely unique in its field, and one for which there is definitely a rising market here and abroad."

Federal's remanufacturing operations on every used refrigerator start "from the bottom up," according to John Bess, vice president and general manager, and no box is assumed to have weathered its period of service with a previous owner without wear and strain on all parts, from unit to shelves.

REBUILDING PROCESS

When a used refrigerator is brought into the Federal plant, regardless of its "outside" appearances, it is torn right down to the base, said Mr. Bess. From this point the remanufacturing process begins, entailing a systematic replacement of worn parts, refinishing of the cabinet, reassembly of all mechanical parts, and a final checking and re-checking ending with a test period.

First, all worn parts are replaced with new standard equipment. Each assembly is equipped with a new expansion valve and thermostat. If the refrigerant metering device is a float system, it is calibrated to exact working order; if it is a dry expansion job, the evaporator is dehydrated in a baking oven.

Bearings and brushes in the motor are replaced and each compressor is furnished with a new rotary seal. Shelves, trays, and other hardware are replaced if defective, or retinned or rechromed if serviceable. If a cabinet is bent or marred, it is "bumped out" much the same as an auto body, filled in, and sanded.

The entire cabinet is then sprayed with three coats of lacquer and polished. Older models get new legs and cabinets are modernized, frequently with the addition of up-to-date features such as automatic interior lights where construction makes it possible.

All finished jobs are supplied with a "work ticket" noting details of replacement or renewal of parts, and serial numbers of motors and compressors are recorded for reference. These user tickets are printed in all foreign languages, according to the country to which the refrigerator is to be shipped. A one-year unconditional guarantee is given on all parts in the remanufactured box.

FOREIGN DEMANDS

Due to the company's large volume of foreign sales, many different current voltages and cycles must be supplied. These are obtained from a working list for each country in which remanufactured refrigerators are sold, and all units are gauged accordingly, said Mr. Bess.

Although Federal Refrigerator Corp. has remanufactured just about every make of mechanical refrigerator, including "orphans" produced since 1930, company officials say that Frigidaire, Kelvinator, and Copeland predominate as remanufactured brands.

In addition to its remanufactured lines, Federal makes its own line of Federal "Custombuilt" refrigerators which are sold direct to retailers—mostly department and radio stores—throughout the country. These are supplied in nine models ranging from 4-cu. ft. to three commercial sizes of 15, 30, and 53-cu. ft. About 250 outlets handle the line, according to Mr. Bess.

About 60% of Federal Refrigerator Corp.'s remanufactured output is exported, company officials say. Viewing the increased demand for these refrigerators abroad, Mr. Brickner and Mr. Bess expressed the belief that there is a good market for used boxes in Europe and the Far East because public acceptance of mechanical refrigeration there still lags because of the relatively high cost of new refrigerators.

"Europeans and other foreigners are not necessarily interested in cabinet refinements and gadgets to

be found in new models each year," declared Mr. Brickner. "What these people want is refrigeration. They are sold on the idea, but not on paying the high prices for new American models which are caused by high import duties, heavy shipping costs, and other reasons which make prices prohibitive to their pocket-books."

"If they can get a serviceable, remanufactured American box at a price equal to or lower than a comparable box made in their own countries, they will buy the American kind because it is generally recognized as a better, longer-lasting job," continued Mr. Brickner. "Public acceptance of mechanical refrigeration abroad is growing steadily, and we are finding 1937 business in remanufactured models very gratifying."

Federal has distributors located in Hong Kong, China; Kobe, Japan; London; Tunis, Algiers; and Glasgow, Scotland, besides several smaller cities. A new distributor in Amritsar, India, has recently been enfranchised, marking the first merchandising of remanufactured boxes in that vast country.

DOMESTIC OUTLETS

Domestic sales on the company's remanufactured refrigerators are handled primarily by department stores located in New York City, Chicago, and in Oakland, Calif., besides numerous other cities. Dealers report that used models are excellent in building store traffic, Mr. Bess stated.

"Naturally, the sales appeal of a remanufactured refrigerator is primarily directed to people in the lower income brackets," he said. "As in the used car business, if a customer can buy a good-looking, 'like new' used job with several years of satisfactory service still in it, price appeal makes a difference. Because we don't take 'junk-heaps' into our plant, we know our boxes are going to give that service."

Mr. Brickner, who was formerly engaged in the textile industry, declared that he and Mr. Bess were applying the same principles to remanufacturing refrigerators.

"First we set about perfecting our process and systematizing it to make possible mass production," he declared. "We believe we have pioneered a new branch of the industry in introducing remanufacturing in the real sense of the word. It costs more from the standpoints of production and cost price to the customer, but results prove it."

Despite the general impression that dealers' "morgues" and warehouses are glutted with used refrigerators, said Mr. Brickner, Federal Refrigerator Corp. is finding it difficult to obtain enough boxes for remanufacture. By April 15, the company was having difficulty meeting its orders.

"I would say that the demand for this type of box is approximately three times the supply," said Mr. Brickner. "Right now, I wish we could get 1,000 boxes in a condition warranting remanufacture. There are plenty of wrecks to be had, but not nearly enough used boxes which can be successfully remanufactured."

In metropolitan New York today, according to Mr. Bess, there are about 500,000 used refrigerators ready to be traded in on new models. This figure is based on utility estimates, he said. These are obsolete from a new model standpoint, and making them available for the remanufactured market depends solely upon activity of retail dealers.

TRADE-IN PROBLEM

"The industry as a whole is definitely faced with a trade-in problem," the Federal general manager declared. "We hope that, eventually, we'll be able to take care of most trade-ins in the New York area with due respect to sales of new boxes. We do not feel that our type of work conflicts in any way with sales of new refrigerators, but rather supplements that phase by bringing refrigeration to low income groups."

The company obtains most of its supply of used refrigerators from financing companies, used box dealers, and by working directly with apartment house refrigerator distributors. No sales of remanufactured boxes are made to apartment house owners, Federal officials say.

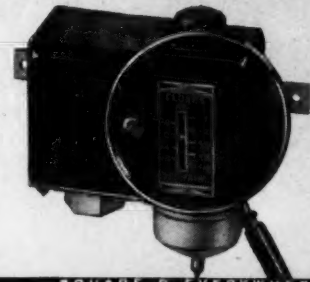
Federal's factory occupies 40,000 sq. ft. of floor space on three floors at 57 East 25th St. Showrooms are on the first floor, with remanufacturing operations located on the upper two floors. The company's Federal "Custombuilt" line of new refrigerators is made at another plant at 34 East 10th St.

THE BUYER'S GUIDE

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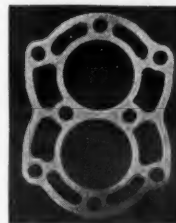
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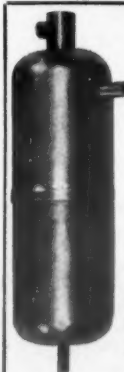
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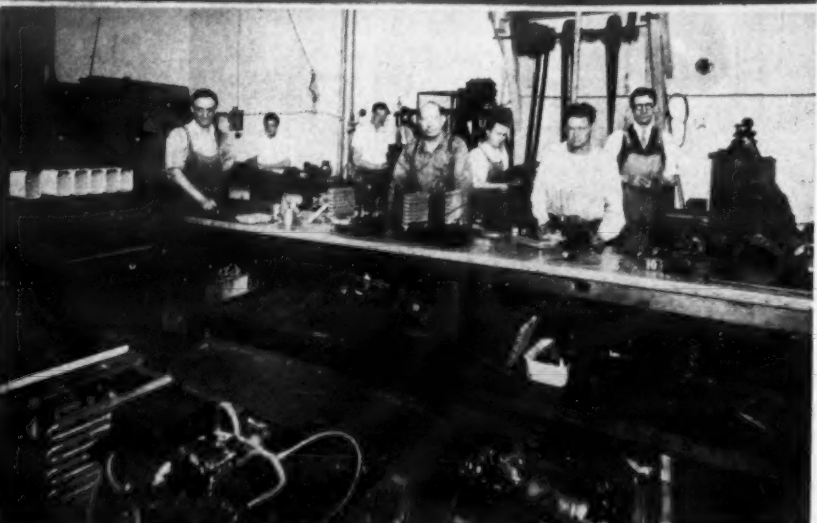
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Remanufacturing Process in Federal's Factory



Scenes from Federal Refrigerator Corp.'s plant in New York City where 3,000 used refrigerators were remanufactured for the foreign and domestic market last year. At top, a section of the cabinet refinishing division; below, part of the machine shop where units are rebuilt and repaired.

THE BUYER'S GUIDE

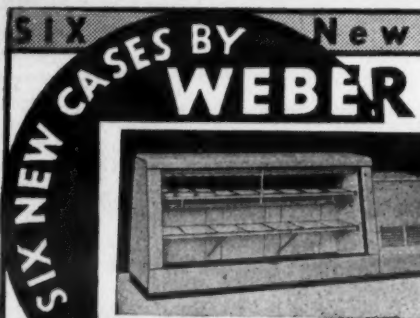


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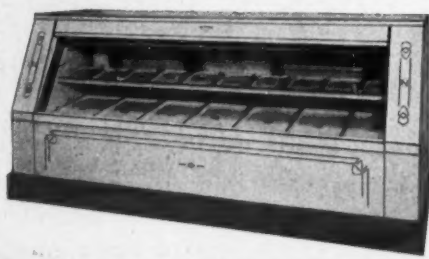


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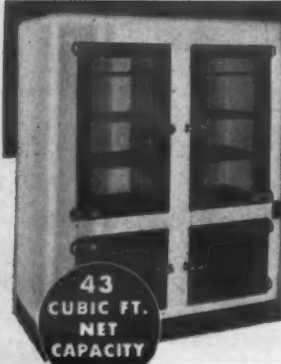


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compression and absorption systems, discusses indirect expansion systems, gives data on the manufacture of artificial ice, and discusses in detail cooling towers and spray ponds.

There are 29 tables in the book which supply a ready reference source for the plant operator. The book contains more than 110 illustrations of parts, hook-ups, and uses.

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Trainor Takes Over G-E Franchise in Waterbury

WATERBURY, Conn.—S. George Trainor, Inc., has been appointed General Electric dealer here. The franchise formerly was held by Orkil Electric Co., and, before that, by Modern Home Utilities, Inc. The Trainor company will operate in the same quarters previously used by its two predecessors.

Mr. Trainor, president and sales manager of the new corporation, formerly was sales manager of Modern Home Utilities, Inc. Arthur Word, once accountant with the same company, is secretary-treasurer of the Trainor firm.

Entire Waterbury retail force of the Orkil company is staying with the new company, and operation of the store's model kitchen and cooking school will be continued.

W. L. Walker to Direct NRDCGA Committee on Trade Relations

NEW YORK CITY—W. L. Walker, former general manager of the Zion Cooperative Mercantile Institution, Salt Lake City, and NRA executive, has joined the executive staff of the National Retail Dry Goods Association's merchandising division to direct the vendors' relations committee in promoting better relations between manufacturers and retailers.

Announcement of Mr. Walker's appointment was made by Channing E. Switzer, managing director. Steady development of cooperative relations between production industries and retailers in recent months has caused the need of a full-time executive to carry on the work, Mr. Switzer said.

Sears Roebuck Opens Specialty Branch Store in Hartford

HARTFORD, Conn.—Sears, Roebuck & Co. has opened a downtown branch specialty shop at 150 Asylum St. to display its line of Coldspot refrigerators and other household appliances.

PATENTS

Issued April 20, 1937

2,077,394. LIQUID SEALED PUMP. Frederick L. Buenger, Chicago, assignor of one-half to Arthur C. Johnson, Chicago. Application May 28, 1934. Serial No. 727,860. 5 Claims. (Cl. 230-205)

2,077,554. AIR CONDITIONING APPARATUS. Walter L. Fleisher, New York, N. Y. Application April 30, 1932. Serial No. 608,392. 2 Claims. (Cl. 261-11)

2,077,576. ELECTRIC SWITCH. George J. Meuer, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis. Application Nov. 9, 1934. Serial No. 752,202. 8 Claims. (Cl. 173-322)

2,077,734. GRILLE. Edward L. Anderson, Grosse Ile, Mich., assignor to American Blower Corp., Detroit. Application Dec. 26, 1934. Serial No. 759,176. 18 Claims. (Cl. 98-101)

2,077,820. REFRIGERATING METHOD AND APPARATUS. Ewald A. Arp, Minneapolis, Minn. Application Oct. 23, 1933. Serial No. 694,781. 18 Claims. (Cl. 62-105)

2,077,839. AUTOMATIC DEFROSTING SWITCH. Charles Christian Hundemer, Baton Rouge, La. Application Nov. 10, 1931. Serial No. 574,211. 5 Claims. (Cl. 62-115)

2,077,865. REFRIGERATION SYSTEM. Daniel D. Wile, Detroit, Mich., assignor

to Detroit Lubricator Co., Detroit. Application March 15, 1934. Serial No. 715,576. 10 Claims. (Cl. 62-8)

2,077,871. MILK REFRIGERATING CABINET. William F. Borgerd, Riverside, and Fred L. McCune and Charles A. Uhrek, Chicago, assignors to International Harvester Co. Application Dec. 29, 1934. Serial No. 759,690. 8 Claims. (Cl. 62-101)

2,077,974. AIR CONDITIONING APPARATUS. William W. Wishart, Chicago. Application June 2, 1933. Serial No. 673,955. 19 Claims. (Cl. 257-7)

2,077,982. REFRIGERATOR. Ralph F. Bixby and John H. Meyer, St. Louis, Mo.; said Meyer assignor to said Bixby. Application Nov. 5, 1934. Serial No. 751,611. 3 Claims. (Cl. 62-91.5)

2,078,073. REFRIGERATOR DOOR LATCH. Carl W. Geske and Elmer J. Roossien, Grand Rapids, Mich., assignors to Winters & Crampton Corp., Grandville, Mich. Application May 25, 1936. Serial No. 81,661. 10 Claims. (Cl. 292-63)

2,078,085. AIR CONDITIONING CABINET. Gottfried C. Lawson, Canton, Ohio. Application July 31, 1933. Serial No. 682,939. 2 Claims. (Cl. 183-35)

2,078,089. COOLING TOWER. Leon T. Mart, Johnson County, Kans. Application

Sept. 18, 1935. Serial No. 41,049. 5 Claims. (Cl. 261-109)

2,078,097. WATER COOLING MEANS FOR REFRIGERATORS. Harry Radzinsky, New York, N. Y. Application Dec. 3, 1935. Serial No. 52,633. 8 Claims. (Cl. 62-89)

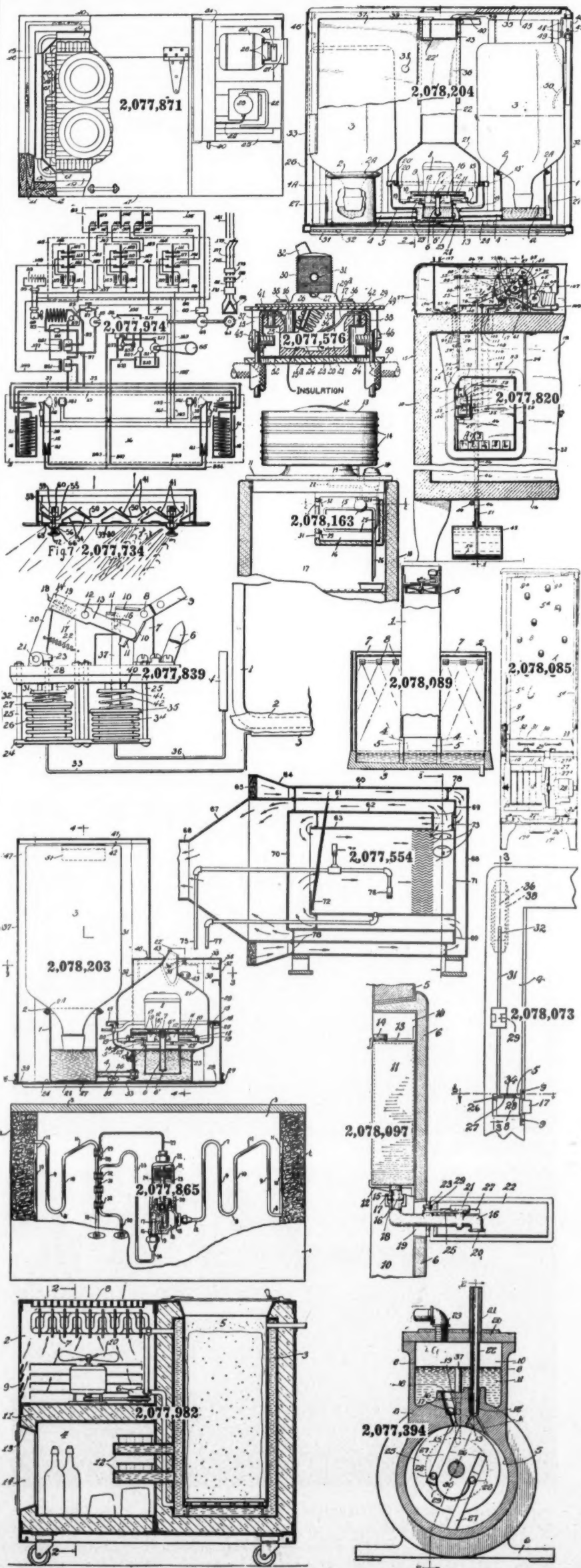
2,078,163. EVAPORATOR FOR REFRIGERATING MACHINES. Ralph F. Roeder, Schenectady, N. Y., assignor to General Electric Co. Application July 1, 1936. Serial No. 88,358. 10 Claims. (Cl. 62-126)

2,078,203. HUMIDIFIER UNIT. Fowler Manning, Bronxville, N. Y., assignor to Standard Air Conditioning, Inc., New York, N. Y. Application March 2, 1935. Serial No. 9,064. 6 Claims. (Cl. 261-91)

2,078,204. HUMIDIFYING APPARATUS. Fowler Manning and Streckfus W. Manning, Bronxville, N. Y., assignors to American Radiator Co., New York, N. Y. Application Sept. 21, 1935. Serial No. 41,520. 19 Claims. (Cl. 261-91)

PATENTS

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RATES: Fifty words or less, one insertion, \$2.00, additional words four cents each. Three insertions \$5.00, additional words ten cents each.

PAYMENT in advance is required for advertising in this column.

REPLIES to advertisements with Box No. should be addressed to Air Conditioning and Refrigeration News, 5229 Cass Ave., Detroit, Mich.

POSITIONS AVAILABLE

POSITION AVAILABLE for engineer capable of writing, developing, and supervising correspondence course in air conditioning and refrigeration. Also openings available for teacher in day and evening sessions of various phases of air conditioning, refrigeration, and drafting. Write only, giving qualifications, etc. TECHNICAL INSTITUTE, 244 W. 14th St., New York City.

TERRITORY SALES REPRESENTATIVES for nationally known, well established manufacturer of commercial and air conditioning condensing units. Only men with good records and experience in establishing distributors, and organizing territories will be considered. Full particulars regarding education, age, experience, territory previously traveled and references must accompany first letter. Unusual opportunity for the right men. State salary expected. Confidential. Box 920, Air Conditioning and Refrigeration News.

OLD ESTABLISHED DISTRIBUTOR with metropolitan area 150,000 and 40 counties middle west requires services of commercial sales manager of selling, executive type. Box 922, Air Conditioning and Refrigeration News.

SALES REPRESENTATIVES: To sell domestic electric refrigerator to appliance, furniture, department, and hardware stores. One size only. Different from every product on market. Has two cubic foot humidified vegetable compartment. Oversized, cold storage compartment, making seventeen pounds of ice at one freezing. A new product of oldest refrigeration company in America, established in 1849. Commission basis only. All U.S. territory open except Pacific Coast, Nebraska, Iowa, Minnesota, Wisconsin, Michigan, northern Ohio, New York, northern New Jersey, New England. Will consider only experienced representatives, thoroughly familiar with outlets in their territories. Give complete details of experience, territory actually covered, manufacturers represented, references. THE JEWETT REFRIGERATOR CO., Buffalo, N. Y.

A PROMINENT MANUFACTURER of automatic controls for heating, ventilating, and air conditioning requires the services of several graduate engineers, or men with a partial engineering training and practical experience, to enter a training course which will lead into the sales, engineering, and production departments. Men between the ages of 25 and 30 are preferred. Write Box 924, Air Conditioning and Refrigeration News.

POSITION AVAILABLE for experienced engineer with old established manufacturer to take charge of design and production of domestic refrigerators and display counters. Must be Canadian citizen or British subject. Write giving references and full details of experience and qualifications to Box 925, Air Conditioning and Refrigeration News.

EXCELLENT OPPORTUNITY for all around shop men capable of managing service shop specializing in complete rebuilding of hermetically sealed units. State qualifications and salary desired. Box 927, Air Conditioning and Refrigeration News.

POSITIONS WANTED

CONTROL ENGINEER seeks connection with manufacturer who recognizes possibilities in simplified, low-priced refrigerant control devices. Inventive ability, broad background in design, development, and production of controls. I. E. WIEGERS, 9335 S. 54th Court, Oaklawn, Ill.

YOUNG MAN, age 22, graduate in Electrical Engineering of the University of British Columbia, who has recently been trained by Refrigeration and Air Conditioning Institute of Chicago, desires a position involving the design of air conditioning equipment and installations with a reliable concern. Has had design and drafting experience. Box 926, Air Conditioning and Refrigeration News.

FRANCHISES AVAILABLE

DISTRIBUTORS WANTED to handle well known Carbon Block Water Purifiers. Guaranteed to remove taste, odor, sediment, discoloration, and everything in suspension. Can be used in connection with all makes of water coolers. Used by leading water cooler companies for more than ten years. Protected territories available. THE WATERS FILTER & COOLER CO., 10 West 29th St., New York City, N. Y.

EQUIPMENT WANTED

USED ELECTRIC dehydrating oven, charging board, Bristol recorders, 16 inch swing lathe and other shop equipment. Give full description, condition, and price wanted. Box 928, Air Conditioning and Refrigeration News.

EQUIPMENT FOR SALE

MAJESTIC SURPLUSES. 1,000 complete units "as is" \$15.00. New Majestic capacitor motors \$4.50. Evaporators \$4.00. Copper condensers \$1.25. Electrolytic condensers 75¢. Two hour test cabinets with air lifts and Bristol recorders. Set of five \$37.50. Cost \$400. 3/16" tinned copper tubing 20¢ lb. G. & G. COMPANY, 5801 Dickens, Chicago.

TWIN CYLINDER and single cylinder Methyl compressors, brand new. Ideal for domestic and small commercial installations. Also fans, pulleys, expansion valves, fittings, recording instruments, receiver valves, and condensers. Priced at fraction of cost. A few 1/2 H.P. A.C. single cylinder complete condensing units. Discontinuing our refrigeration department. Box 914, Air Conditioning and Refrigeration News.

REPAIR SERVICE

MAJESTIC AND GRIGSBY-GRUNOW refrigerator and radio parts service. We have purchased all of the original Grigsby-Grunow Majestic refrigerator and radio parts service. We are the only original, the only genuine, the only direct factory parts and service anywhere in the world. Beware of inferior replacements and parts. Everything we sell is factory guaranteed. Send for prices and dealerships. G. & G. GENUINE MAJESTIC REFRIGERATOR & RADIO PARTS SERVICE, 5801 W. Dickens Ave., Chicago.

MAJESTIC — GENERAL ELECTRIC — SERVEL hermetic units repaired and exchanged. Majestic—\$20.50—General Electric—\$25.00—Servel—\$18.50 F.O.B. our factory. One year unconditional guarantee. Every unit undergoes complete tests for temperature, cycling, wattage consumption and quietness on genuine test equipment. See our advertisement this issue under "Buyer's Guide". REFRIGERATION MAINTENANCE CORP., 365 E. Illinois St., Chicago, Ill.

DOMESTIC REFRIGERATION controls repaired. Ranco pencil types \$1.75, all others, \$2.00. All work unconditionally guaranteed for six months. Jobs completely refinished. Prompt service. UNITED GAUGE AND INSTRUMENT CO., 436 West 57th St., New York City.

GENERAL ELECTRIC and Majestic hermetically sealed units repaired and exchanged. Guaranteed work. Wholesale prices quoted f.o.b. Chicago. AMERICAN REFRIGERATING ENGINEERS, INC., 2257 Silverton Drive, Chicago, Illinois.

CONTROLS REPAIRED for the refrigeration and air-conditioning trade. Any make, almost any type. Every control individually calibrated. Steam traps, packless valve glands, and regulators repaired. If it contains a bellows, Hallectric can repair it. Service prompt, prices right, guarantee reliable. HALLECTRIC LABORATORY, 1793 Lakeview Road, Cleveland, Ohio.

DRY ICE FOR SALE

DRY ICE USERS! Can supply solidified CO₂ (dry ice) from carbon dioxide gas (CO₂) or would sell gas to parties desiring to manufacture their own supply from the pure carbon dioxide gas produced from our gas supply in Harding County, New Mexico. DANCIGER OIL & REFINERIES, INC., Fort Worth, Texas.

ARTIFICIAL FOOD DISPLAYS

MANUFACTURERS of artificial fruits, vegetables, meats. Over fifty pieces from which to select, including full size Turkey, Capon, Chicken, and Watermelon. Sets to accommodate every make of refrigerator. Reasonable prices ranging from \$2.75 to \$9.00 per set. Write for complete data. ROMAN ART CO., INC., 2704 Locust Blvd., St. Louis, Mo.

New Detroit Advertising Regulations Listed

(Concluded from Page 1, Column 4) ers, or other electrical appliances through classified advertising must clearly identify themselves as dealers by signing their business name to the advertisement.

"2. The year of model shall be stated in advertising, when other than current model appliances are offered, and used merchandise shall be clearly designated as such.

"3. Trade-in allowances shall not be fixed or arbitrary, but shall reflect their bona fide nature by clearly specifying that the amount of allowance depends upon condition and model.

"4. When a price is quoted on a refrigerator, the cubic foot capacity of that refrigerator shall be stated.

"5. If several brand names are mentioned in an advertisement, no 'bottom' price shall be featured which does not apply to all brands listed. Example: '1936 model Frigidaire, Grunow, Leonard, Crosley, \$39.50 and up.' The 'bottom' price of \$39.50 shall not be used unless 1936 models in each brand are available at that figure.

"6. The actual price of illustrated models shall be clearly and prominently stated in immediate conjunction therewith.

"7. No brand name or special sale price shall be advertised unless reasonable stocks of the featured item are on display and readily available to purchasers.

"8. Published claims alleging savings shall in every instance specify the exact selling price of the merchandise."

After reading these provisions to the dealers, Mr. Lass cut loose with a condemnatory blast against illegitimate advertising that won a substantial round of applause from his listeners.

Quoting from the classified advertising columns of a recent edition of a Detroit daily newspaper, Mr. Lass cited several examples of ads which he termed "lousy" and "vicious." All

ads quoted were in direct opposition to the standards set up by the Better Business Bureau.

"Merchants will no longer be allowed to advertise lines for which they are not franchised dealers," declared Mr. Lass, "for the distributors will see to that. Some dealers have been advertising repossessions on all lines, but this is going to be stopped also. From now on dealers are going to be made to show where they repossessed these boxes, and these repossessions must be bona fide. Advertisement of the 'lowest price' or 'biggest bargain' in town is also going to be stopped.

"And just remember," he continued, "that if you do step over the line on this matter of advertising, I won't jump you but the Better Business Bureau will."

Mr. Lass then quoted from letters of cooperation and support which he had received from advertising directors of the leading metropolitan dailies. These papers have agreed to follow the recommendations of the Better Business Bureau in regard to illegitimate advertisers, and as a result of this policy several advertisers already have been denied use of the papers' advertising columns for failure to "clean up" their ads.

Earlier in the meeting, Mr. Lass had set forth the purpose of the association, and had given a brief outline of its origin and background. "Detroit Appliance Dealers Association," he explained, "is really an outgrowth of the Better Appliance League organized here in 1935. Although the association's name is different, it is still operating under the charter of the former group.

"About a month or so ago, a group of appliance dealers here became disgusted with existing merchandising conditions, and organized more or less informally to see if they couldn't devise a way to better the local appliance situation. It was this group which persuaded me to leave Grand Rapids and come here to try to clean up conditions in Detroit."

Speaking of the meeting which he had had with distributors earlier in the week, Mr. Lass declared that the wholesalers had seemed to be heartily in accord with the association's purpose.

"As proof that the distributors are ready to play ball with us," said Mr. Lass, "they have agreed to take no more purchasing agent orders." This statement also was greeted with applause.

"And the distributors mean business," Mr. Lass continued, "for three dealers lost their franchises last week, and others have been warned.

"Another thing that the distributors have agreed to do is to refuse contractors' orders unless these are valid. If a man is actually a contractor, and actually has a home under construction, he will be permitted to buy electrical equipment from a distributor at a reasonable discount, but no one else will be permitted to do so.

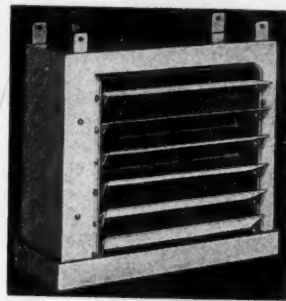
"Wholesalers also have agreed to discontinue selling to any but franchised dealers."

Mr. Lass reported considerable progress among outstate dealer groups. In Grand Rapids, 41 of the town's 45 dealers are association members. Organization in Flint, said Mr. Lass, is nearly as strong.

"The association bug is even hitting the small towns such as Cadillac," he said, "where all eight dealers belong to the association in spite of the fact that the group only organized last week. They even have drawn in two dealers operating outside of the town's limits.

"Unification of the many local dealer organizations into a state appliance dealers' association is continuing as rapidly as possible," said Mr. Lass, "and we hope to have the group incorporated and operating under a charter sometime in June."

THE BUYER'S GUIDE



UNIT BLOWERS

Pipe Coils
Air-Conditioning Coils

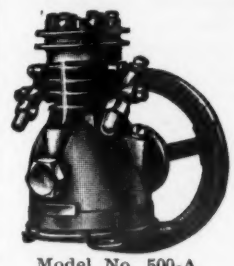
FIN COILS

5/8" — 3/4" — 1"

Steel or Copper

REMPE COMPANY

340 N. Sacramento Blvd. Chicago, Illinois



"CHIEFTAIN"

QUALITY-BUILT
COMPRESSORS and
CONDENSING UNITS

All bearings diamond bored. Positive lubrication of parts by newly developed process plus forced feed lubrication in all models.

Sizes 1/6, 1/5, 1/4, 1/3 h.p.
Write for prices

TECUMSEH PRODUCTS CO.

Tecumseh, Mich.

OFFICES

New York
480 Lexington Ave.

Chicago
Room 2258
La Salle-Wacker
Building

Detroit Export
Department
1002 Palms Bldg.

Los Angeles
122 Mariposa St.

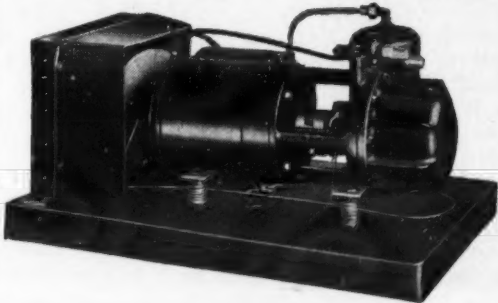
St. Louis
577 Arcade Bldg.

MILLS COMPRESSORS

for Commercial Use

Mills Novelty Company • 4100 Fullerton Avenue • Chicago, Illinois

Revolutionary New Oscillating Compressor!



A life-saver for manufacturers not making their own units! Here's the opportunity for Service Companies to save their customers money and give them a new up-to-minute unit at a lower cost than repairing the old one!

Write for Prices and Details!

O'Keefe & Merritt Co.
3700 E. Olympic Blvd.
Los Angeles, Calif.

GIBSON Condensing Units

Hotels Bars Fountains
Institutions Food Stores
... and All Other Commercial Uses

1/4 H. P. to 15 H. P.

Air Cooled—Water Cooled

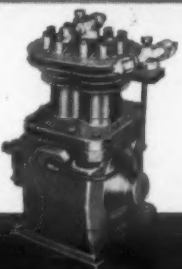
Get Our Proposition Before You Buy

Gibson Electric Refrigerator Corporation

Greenville

Michigan

REPLACEMENT COMPRESSORS for All Standard ICE CREAM CABINETS



Bare Compressors and complete units (with or without motor and controls) especially adapted to ice cream cabinet installation and for replacement on all standard makes of flooded type or dry expansion systems.

Write for new catalog.

MERCHANT & EVANS COMPANY

Philadelphia, Pa., U.S.A., Plant at Lancaster, Pa.

UP-TO-DATE SPECIFICATIONS DATA

1937 DATA TO BE INCLUDED WITH 512-PAGE BOOK

A new 64-page booklet giving specifications of principal makes of 1937 Household Electric Refrigerators will be given with all future orders for the 1936 Specifications Book which includes data on all models of all makes of household and commercial refrigeration equipment and air conditioners for all years.

The material is a revision of that which appeared in the March 17 issue of the News plus the tabulation of "convenience" features which appeared in the News issued April 21.

Material in the Specifications Book was compiled with a view toward making it usable by both the service man and salesman. For the service man, the 512-page book gives information on the kind and quantity of refrigerant, belt size, compressor and motor data, etc. Of interest to salesmen is the list price, cubic-foot capacity, dimensions, shelf area, finish, etc. This information applies to commercial condensing units and air conditioners as well as household electric refrigerators.

Price \$3.00 per copy . . . Send order with remittance to

BUSINESS NEWS PUBLISHING CO., 5229 Cass Ave., Detroit, Mich.

